Evaluating the Industrial and Occupational Foundations of the Iowa Lakes Region

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Introduction

This is an applied research and technical assistance project for the Iowa Lakes region that consists of Buena Vista, Clay, Dickinson, Emmet, and Palo Alto County. The objective of the research is to help the region to identify its industrial and occupational strengths, to clarify its potential for job growth, and to help educate economic development officials about their economic and social foundations.

We employ what we call a key industrial analysis approach to this research. This involves, using standard economics criteria and measures that we have devised, isolating industries in the region that stand out from the state and the nation – areas where the region appears to have a clear competitive advantage. This research is supplemented by additional data that help us to understand characteristics of the region's industrial structure to include firm size, average earnings, the amount of sales that are generated in different sectors, and the overall worth of the firms to the regional economy.

Taken as a whole, all industries are important to a region for a variety of reasons to include their job potential, the incomes that are generated, their importance to communities and collections of communities, and their importance to other industries. Industries are not only important to workers and communities, they are important to each other. We measure this importance by tracking the flow of inputs into different sectors of the economy and measuring just how interdependent industries are with one another. Accordingly, we use statistical means to isolate regional industrial linkages and the degree to which there may be meaningful and sustainable industrial relationships in a region. This section outlines the major terminology used for this research and the approach to studying the region that we employ.

What Do We Mean by Industrial Linkages?

Linkages

There are two types of industrial organizations pertinent to this research: those with *horizontal* relationships and *vertical* relationships. These relationships can also called *linkages*. Horizontal linkages occur when similar firms producing similar products rely on shared input sources. These kinds of firms have access to highly efficient and

common suppliers, skilled labor pools, and may even benefit from public infrastructure designed specifically for their industrial group. These kinds of firms may also collectively develop product ideas, promote their products collectively, and cooperatively organize to influence laws and regulations (lobbying). Good examples might include computer software and advanced information technology sectors in, for example, Seattle or the Silicone Valley region of California. Central Iowa's extensive insurance industry is another good example.

Vertical linkages exist when we find evidence of significant relationships along different lines of production. In Iowa, for example, there may be strong vertical relationships from crop production, to animal production, to meat slaughtering, to specialized processing. These kinds of relationships imply a rich "multiplier" effect to the extent that the multiplier reflects the value of successive processing that may occur in a region, not the likelihood that new jobs are created.

These two types of configurations are not mutually exclusive. Horizontally-linked firms certainly may and most likely will have rich and significant linkages to sets of suppliers in their region. Vertically-linked firms, on the other hand, can very well exist in the absence of any significant horizontal relationships, especially in more rural areas. It is therefore important for the analysts to thoroughly research the potential for or the value of supplying relationships (linkages) in a study region so that the reader understands whether there are meaningful multiplier effects to be considered or whether there are other, non-multiplier effects at work in an economy.

Industrial Agglomerations

There is also a geographic component to industrial analysis. When like industries (those horizontally configured) or inter-related firms (vertically configured) exist in some meaningful proximity to one another, they constitute a proximal "cluster" of economic activity. Some industrial location research incorporates spatial statistics of actual firm locations to determine whether there are, in fact, significant geographic correlations of firms in evidence in a region, beyond what would be expected in a typical regional economy. The research presented here will not look at firm specific locations; instead, it looks at the overall size and comparative competitiveness of industries in the region. Our approach is to isolate key industries and to profile their characteristics, not to promote the identification of or predict the possibility of industrial clusters.

Economic Advantages and Disadvantages of Industrial Concentrations

There are both advantages and disadvantages to the existence of industrial concentrations in a region.

Advantages

- Localization agglomerations emerge because firms are able to tap into more specialized (and efficient) suppliers of inputs and producer services, and the firms are able to access an adequate pool of specialized and skilled workers.

- These types of industrial concentrations may be more responsive to demands for re-organization, re-investment, and related industrial spin-offs as a consequence to their proximity to each other, because of their pool of both specialized suppliers and labor in the region, and the need to remain not just globally but regionally competitive with one another.

- The opportunity for inter-firm and intra-industry communication, cooperation, and coordination regarding their collective capacities to identify markets, share and disseminate expert industrial knowledge, and otherwise operate beneficial formal and informal networks is great.

- Last, there is the potential for larger localized economic impacts than similar firms not exhibiting a regional concentration. The existence of linked, affiliated or supplier firms in a region and the ability of those firms to concomitantly grow with, adapt to, or gear up to supply necessary inputs into new firms implies a larger regional multiplier effect. A multiplier is simply a ratio that expresses the relationships of one kind of firm in an economy to other businesses. The higher the multiplier, the greater the linkages, the greater the potential value of a firm's growth (or decline) to the local economy.

Disadvantages

- The presence of locational agglomerations can be disadvantageous to an area. A notable national example is the entire textiles industry. This industry has been significantly concentrated in the Middle Atlantic and Southern states. Over just the past 10 years, the nation's textile industries have lost 570,000 jobs. Those manufacturing job losses are highly localized among urban areas and result in significant multiplied-through losses in fabric mills, accessory manufacturers, cut and sew apparel makers, fiber and yarn mills, and thread manufacturers. The advantageous multipliers of growth are highly disadvantageous to regional

economies during declines. The fortunes of U.S. automakers also demonstrate the down-side of localization agglomerations. As Ford and GM continue to re-size and down-size over the next few years, industries that existed solely to supply them with parts and engineering inputs will necessarily downsize as well. The multiplier effect works in reverse, too.

- Iowa's rapid growth in biofuels production currently portends the rapid development of supply, storage, distribution, and other technical assistance concentrations, most notably in large portions of north-central and northwest Iowa. The overall durability of those production concentrations remains to be proven however over the medium term.

Key Industry and Occupational Analysis

Regional economic development planning organizations increasingly rely on industrial analysis techniques designed to isolate key industries and evaluate a region's competitive strengths, weaknesses, and development potential. By helping regions to isolate their key industries, these methods aid the efficient use of public and private economic development resources.

Of late, much attention has been focused on the overall capacity of the state of Iowa to grow, let alone its separate regions. The first component of that focus is the state's occupational structure. The second component is the state's ability to both train and retain workers in sufficient quantity to supply anticipated future industrial needs. This research incorporates several evaluation matrices to assist regional planners in evaluating their occupational strengths and weaknesses as well.

When the key industry and occupational analyses are combined, they allow regions to much more accurately gauge their regional strengths, identify challenges to growth, and better plan for their industrial and human resource needs.

There have been, historically, several general approaches to this type of analysis, all of which are designed to yield a manageable set of desirable industries for development activities and regional economic development.

Top-Down Targeted Industry Approaches

Relying on an established list of "desired" industries, a region's industrial portfolio may be assessed to ascertain how closely it aligns with the list. This research is typically used to gauge an area's overall economic strengths and alignment with a set of overarching growth goals for a regional or a statewide economy, thus its characterization as a "top-down" approach.

For example, the state of Iowa, relying on research conducted over many years and successive consultancy reports, has determined three major categories of desired growth are compatible with its existing industrial strengths, represent possible emerging industrial growth opportunities, or will otherwise beneficially diversify the state's economy. These industries, and there are hundreds of them, are organized into three main groups to include life sciences industries, advanced manufacturing, and information technology.

Pre-defined Clusters

Analysts may also assess a region's industrial structure to detect the presence of industries that align with specific, nationally pre-defined industrial groupings. These groupings are now also commonly called industrial clusters. Following the "birds of a feather" maxim, the presence of an industry fitting into a proto-typical cluster might suggest a local competitive advantage in attracting other firms or industries in that cluster grouping.

Identifying cluster potentials based on national industrial criteria may contribute very little information to a region about its own unique industrial structure and relationships, its intrinsic strengths and weaknesses, nor how the interplay of those factors shape its overall attractiveness to different types of industrial prospects. The applicability of this approach to the needs of most rural regions is highly questionable, yet still remains popular in some circles.

Asset mapping and industrial targeting

Economic development agencies, professionals, and analysts are currently and broadly engaged compiling estimates of regional industrial strengths and weaknesses. These efforts often come under the rubric of asset mapping, and include estimates of regional critical development infrastructure, occupations, populations, along with an accounting of regional economic activity. These activities are highly useful as a baseline

assessment, but they do not often lead to action steps for regions absent timely facilitation and group processing.

Currently, in response to the closing of the flagship Maytag operation in Newton, Iowa, for example, there is a multi-dimensioned effort at asset mapping and industrial assessment for a several county region. This effort is noteworthy for two reasons: first it is funded to the tune of $250,000 with federal money, an amount of aid unrealized by most regions in Iowa, including those that have suffered far more severe job losses than the storied Maytag closing. Second, it is a broad-based, multi-county, and multi-faceted approach to help renovate and restore the regional economy in light of its losses. The effort is being facilitated to develop and implement multi-step plans and remedy weaknesses. If the effort is successful, it may provide a model for assistance to other impacted regions in the state.

Cautions on Targeted Industrial Development Strategies

- This entire process pits local leaders and economic development planners against the entire regional, national, and global economies and puts them in the position of sorting out industrial winners from losers. It's asking them to be smarter than they can possibly be. The consequences, on the margins, can be great for choosing poorly. While, for example, people in northwest Iowa still bemoan the lost opportunity when Gateway Computers abandoned its Iowa base near Sioux City and relocated to North Sioux City, South Dakota, the fact remains that the computer industry has tremendously transformed itself over the past decade or so. And now that Gateway is essentially gone from the region, who is left holding the economic development bag? Even though the nation added more than 130,000 jobs in semiconductor and electronic component manufacturing between 1993 and 1998, it turned around and lost 188,000 of these jobs between 1998 and 2003. Five years of relatively robust growth were followed by five years of stark decline. Industrial development officials at the state and local levels that cut multi-year deals with these kinds of firms found themselves increasingly holding the bag, rhetorically and fiscally, for something that was once quite promising that is now bust. Another regional example is the Mitsubishi Motors situation in Bloomington, Illinois, which is now, after not very long in existence, significantly downsizing. Last year's economic development hero can be this year's economic development goat. Recently, Pella Windows announced it was shutting down its Story City plant.

- Fads. The terms industrial clustering, gap analysis, and asset mapping are bandied about so much that they have muddled meanings for many. There are other categories of industrial change occurring continuously that may or may not have an impact on local production, local capacity, or local growth. It is difficult for most planners and elected leaders to sort out fad and faddishness from fact.

  A case in point: Iowa aggressively promotes its potential in biotechnology, especially as it relates to the state's existing cash crops. It is not surprising that 49 other states also list biotechnology industries among their top industrial recruitment prospects. It is implied that, because Iowa is heavily and valuably farmed, it has an obvious advantage in this area. It can also be implied that such a heavily and valuably farmed region can be placed at risk if rules and safeguards are not put in place to protect traditional agriculture from emerging agriculture and non-agricultural uses of farm commodities. In short, the entire biotechnology category of industrial growth potential is substantively lacking regarding product definition, market growth, producer and community risks, and global acceptance of future products and processes. Sorting fad from fact, growth opportunity from risky venture, and isolating the appropriate investment levels of public infrastructure and resources requires insights into the future that most local officials, nor anyone else, could possibly possess.

- The whole industry marketing process has risks. Statistical measures are applied to assist decision makers and to provide guidance. But statistical measures in and of themselves must be tempered by both expert perspective on the parts of analysts, assessments of recent trends and transformations in the economy, and the considered local expertise that development officials possess. If the two dimensions are not able to communicate clearly, industrial targeting research and programming can be an exercise in futility. Information is useful to decision making, but it cannot supplant common sense.

- In addition, expectations for both job and income growth and regional change must be made explicit and be based on realistic data. There is often a large difference between the rhetoric of growth (declared new jobs, retained jobs, etc., and regional multipliers) and actual quantified growth. Iowa's local governments are easily dedicating in excess of $250 million annually towards economic development as investment in urban revitalization, infrastructure or development site investments, or more and more commonly as simple tax abatements in support of industrial

growth. The state of Iowa of late has dedicated hundreds of millions more. The relationship between direct state and local investment in economic development and the likely beneficial outcomes to the entire Iowa economy are very poorly demonstrated. In short, in an era where governments must increasingly pay to play in the arena of economic development, and the "pay" is taxpayers' money of some form or another, it is often not clear what the payoff is to communities, the state as a whole, and the average well-being of its citizens per public dollar re-channeled away from other traditional government uses. In short, the benefits of economic development activity as compared to the cumulative costs are very hard to quantify.

All of this acknowledged, however, regions and planners engaged formally in industrial and occupational activities should be able to attain a competitive advantage vis a vis regions that have not undergone this kind of a process. The process should assist planners in focusing their efforts, targeting scarce public resources, and in increasing their likelihood of enhancing the stability of their regional economies.

Regional Economic Development Research and Programming Requirements

The overall expected outcome of all key industrial and occupational assessment processes is to bring intelligence and information to bear on the economic development activities so that scarce public and private resources are maximized towards promoting economic growth and regional stability. Regardless of the approach, whether top-down, heavily researched, locally-participatory, or a blend of them all, the process should be driven by participant consensus in at least three major areas:

- The region is responsible for developing its economic development goals and identifying the specific objectives that it intends to accomplish in support of those goals.

- The region, ultimately, is responsible for selecting the industries for targeting that best fit with its goals and with the region's collective expectations for industrial growth. Analysts can provide lists of desirable industries and criteria for evaluating them, but outside analysts do not select the region's goals or its industrial priorities.

- The region develops procedures, programs, and activities designed to recruit industries, retain or expand industries, provide or otherwise facilitate technical assistance and occupational development to improve industrial productivity, and,

not to be forgotten, promote programs to assist small business development and entrepreneurial activity in keeping with its industrial recruitment and development goals. Economic development is a comprehensive process that is conducted in light of community and regional capacities and the collective needs of the citizenry.

In this entire process it is important for the region and the participating analysts to pay particular attention to the region's strengths, whether they are industrial, labor based, or locational, along with the region's capacity to supply public goods. When an industrial targeting approach is employed, it provides a research and procedural foundation for focusing both private and public resources in support of community and regional growth.

By using a goal-driven process for identifying industrial prospects, the region should be able to

- better identify the region's industrial needs and its capacity for growth,
- more efficiently utilize existing resources, and potentially,
- limit its reliance on or otherwise focus growth inducements, like tax abatements or other development incentives

II. Demographic and Economic Overview

It is pointless to evaluate a region's capacity for growth and change without first taking an inventory of basic economic and social assets. There are vast differences in economic activity, social structures, and population attributes across the state of Iowa – it is not a homogeneous plain. Rural areas differ markedly from trade centers, and trade centers differ markedly from metropolitan areas. The extent to which areas deviate plus or minus from state averages helps us to understand the areas' basic capacities and basic performances over time.

Population Characteristics

The total population of the Lakes region declined during the first part of this decade (See Table 1). While the state of Iowa grew by just 1.9 percent over the first six years, about a third of the rate of the nation, the region as a whole declined by 2 percent. Only Dickinson County posted a gain, 3 percent, while Palo Alto and Emmet County posted losses of 5 percent or greater.

Table 1

Population Change, 2000 to 2006

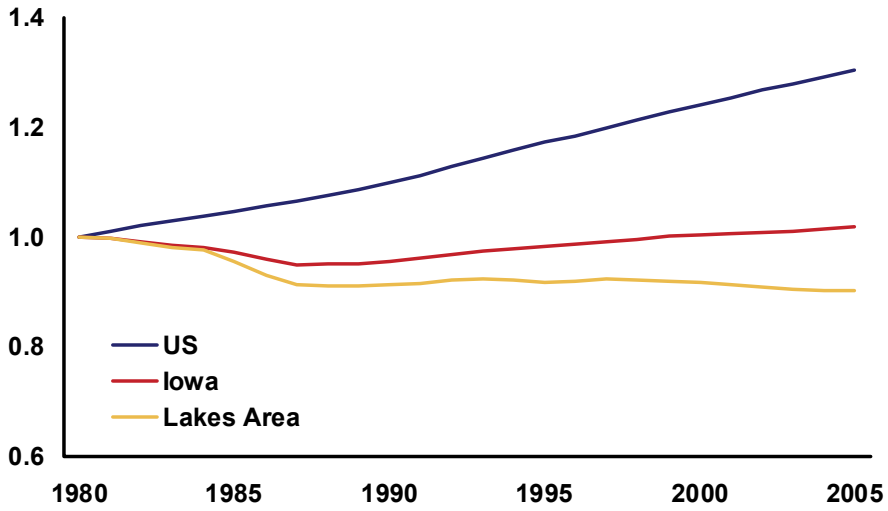
	Census 2000	July, 2006	Change	Percentage Change
State of Iowa	2,926,324	2,982,085	55,761	1.9%
Buena Vista	20,411	20,091	-320	-1.6%
Clay	17,372	16,801	-571	-3.3%
Dickinson	16,424	16,924	500	3.0%
Emmet	11,027	10,479	-548	-5.0%
Palo Alto	10,147	9,549	-598	-5.9%
Region Total	75,381	73,844	-1,537	-2.0%

Over this same period, for the entire state of Iowa, nearly two-thirds of counties posted population declines, with most net growth for the state occurring only in its metropolitan counties and those counties that are adjacent to them. Counties that do not contain a major trade center city or are at some distance from a major employment center were much more likely to post population losses.

The region's population has lost ground to the state of Iowa persistently since 1983 (Figure 1). The rate of loss slowed by 1987, but the region is still realizing some erosion in population since. During this period of time, the nation grew by over 30 percent, Iowa grew by only 1.7 percent total, and the Lakes area declined by 10 percent. Since the mid 1990s, the region's divergence from the state is more evident.

Figure 1

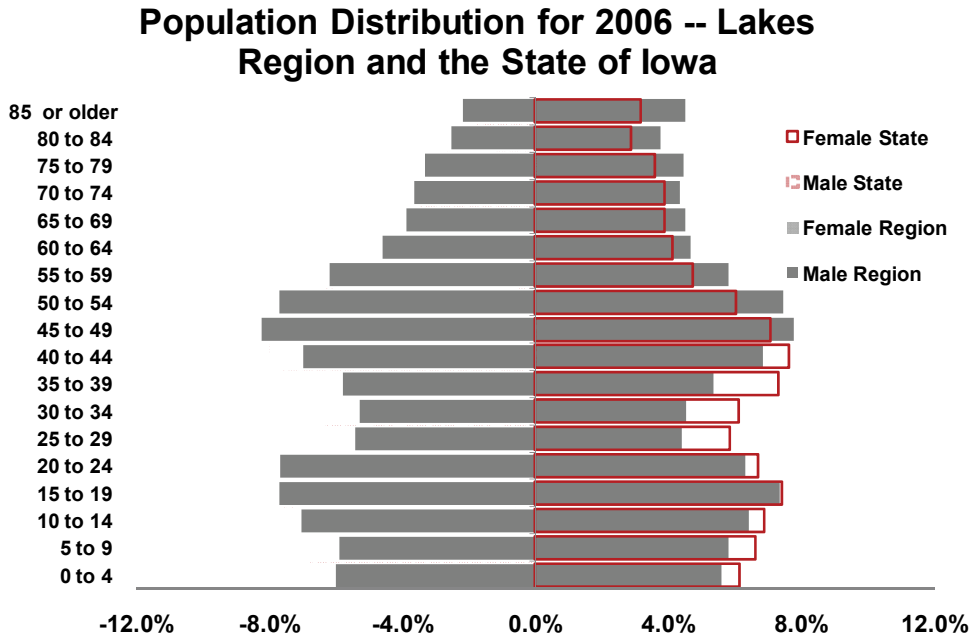
Index of Population Change: 1980 = 1.0 (or 100%)



Age Distribution

Figure 2 is the composition of the region's population by age group. It compares the distribution of males and females in the region to the state of Iowa distribution for 2006. It is evident that the region has proportionately many more elderly men and women than the state of Iowa, as well as a much larger fraction of baby boom-aged people, those ages 45 to 64. If those proportions are much higher, then there must be deficits in evidence elsewhere. The region posts significantly lower percentages of persons from ages 25 to 44. This also "echoes" through, resulting in proportionately fewer children than the state average experience.

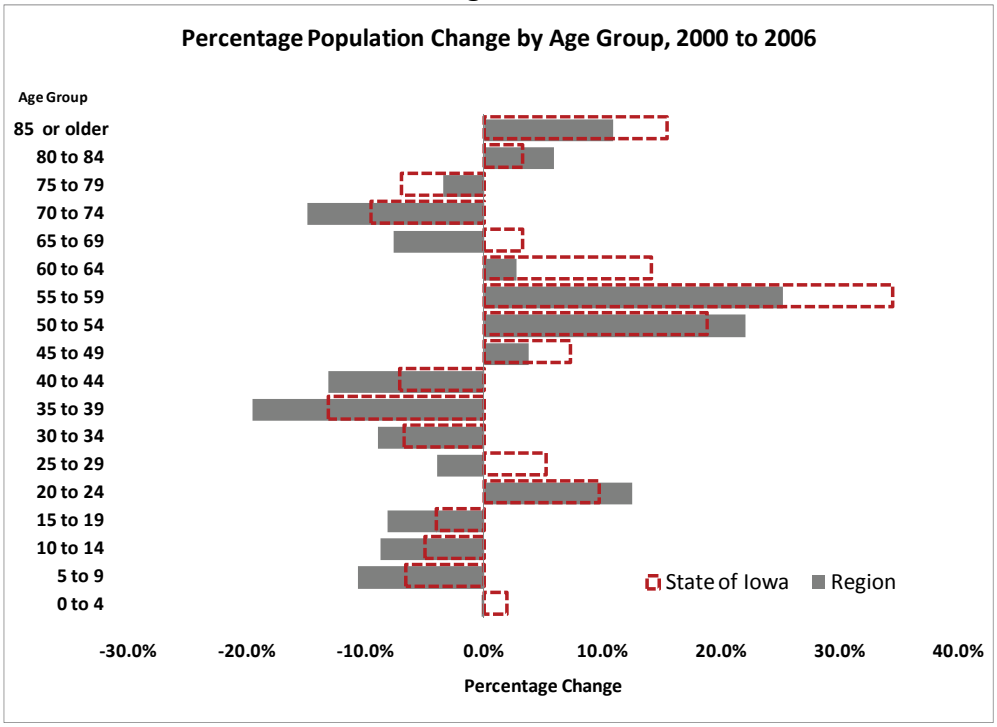
Figure 2



The proportion and the number of persons ages 25 to 39 is an important statistic for anticipating whether a region has the capacity to grow. In short, that is the prime labor force for any developing industry in any region of the U.S., and a comparative deficit of persons of those ages suggests lower growth probabilities for an area. In addition, because of a comparative deficit of young adults, these regions also have a comparative deficit of children. The young adult population deficiency portends a future deficiency as its succeeding generation is also comparatively smaller.

Figure 3 next shows the estimated population change in the region by 5 year age group over the 2000 to 2006 period as compared to the state of Iowa. There are three patterns of note in this graph. First, although the region had greater proportionate gains in the number of young adults, ages 20 to 24, it had much greater reductions than the state experience in all other young adult categories through the age of 44. Concomitantly, the region also had greater than the state reduction in children, yielding additional evidence of the intergenerational concerns that will beset the region in upcoming years. Last, the region posted a greater than expected reduction in the number of persons from ages 65 through 74, the so-called “young elderly” group. This indicates that regional retirees are more prone to relocate elsewhere in the state besides this region.

Figure 3



The intergenerational change statistic, the smaller proportions of young people, is demonstrated further in Table 2. From the 2000 to 2001 academic year through 2006-2007, the region suffered a 7.3 percent decline in school enrollment. Palo Alto had more than twice the regional decline at 15.5 percent, with the lowest decline in Buena Vista County. These numbers reinforce the preceding table and indicate that the fixed cost of education are likely to be consumed by fewer students and paid for by a declining number of taxpayers.

Table 2. School Enrollment in the Lakes Region

School Year

	2000-2001	2006-2007	Change	Percentage Change
State of Iowa	492,022	483,122	(8,900)	-1.8%
Buena Vista	3,810	3,750	(60)	-1.6%
Clay	2,822	2,548	(274)	-9.7%
Dickinson	2,800	2,668	(132)	-4.7%
Emmet	1,944	1,727	(217)	-11.2%
Palo Alto	1,839	1,554	(285)	-15.5%
Region Total	13,215	12,247	(968)	-7.3%

Components of Regional Population Change

When we study a region's population, we are interested in the components of change. There are only three components to area population change: births, deaths, and migration. We can decompose population change into these elements to see which are playing what parts in explaining area changes.

The overall performance of the region on these elements is displayed in Table 3. The region's total change of -1,537 persons is explained as follows. It had a natural change of 491, net outmigration of 1,778, and 248 persons for whom estimates could not account. Two of the counties, Pala Alto and Dickinson were in natural decline as there were more deaths than births. The vast majority of natural change in the region is attributed to Buena Vista County gain, and only Dickinson County had net inmigration. Net outmigration consists of the sum of all international migration into the region and all domestic migration to or from other states.

Table 3. Components of Population Change, 2000 to 2006

Components	Buena Vista	Clay	Dickinson	Emmet	Palo Alto	Region
Births -	1,609	1,302	1,069	833	684	5,497
Deaths =	1,159	1,128	1,088	790	841	5,006
Natural Change	450	174	(19)	43	(157)	491
Migration	(695)	(696)	582	(554)	(415)	(1,778)
Residual	*(73)*	*(49)*	*(63)*	*(37)*	*(26)*	(248)
Total Change	(320)	(571)	500	(548)	(598)	(1,537)

The Labor Force

There is relatively strong alignment of the region's overall labor force performance with the state, as shown in Table 4. Through November of last year, the year-to-date statistics indicated the regional unemployment rate was just 3.5 percent. Clay was lowest at 3.1 percent, and Dickinson and Emmet were highest at 3.7 percent. By all standard comparisons, these are relatively low unemployment rates.

Table 4. Labor Force Characteristics Through November 2007

	Employed	Unemployed	Labor Force	Unemployment Rate
State of Iowa	1,602,700	60,600	1,663,300	3.6%
Buena Vista	10,020	340	10,360	3.3%
Clay	9,850	310	10,160	3.1%
Dickinson	10,020	380	10,400	3.7%
Emmet	5,740	220	5,960	3.7%
Palo Alto	5,220	190	5,410	3.5%
Region	40,850	1,440	42,290	3.4%

Regional Jobs

Table 5 gives us the total number of jobs in the region as provided by the U.S. Bureau of Economic Analysis. Jobs are counted where they are located, regardless of where the job-holder lives. There are newer numbers available from the Department of Labor, but the patterns of change over time demonstrated here are instructive for this portion of the report. During the 1990s the region enjoyed an annual rate of job growth similar to the state and the nation. Although Palo Alto's rate was half the regional average,

Dickinson's was nearly twice as high, so there was a lot of variability within the region. During the first half of this decade, however, the region stalled. The nation's rate of annual growth was half the previous decade, and Iowa's rate was a fourth of its previous rate. The Lakes region, however, is stagnant overall. Dickinson continues to lead the region, but Palo Alto, Clay, and Emmet County posted declines over the period measured.

Table 5. Total Jobs 1990 to 2005

				Annual Rate of Change	
	1990	2000	2005	1990 to 2000	2000 to 2005
US	139,380,900	166,758,800	174,249,600	1.8%	0.9%
State of Iowa	1,645,944	1,934,077	1,968,219	1.6%	0.4%
Buena Vista	12,021	13,553	13,745	1.2%	0.3%
Clay	11,093	12,707	12,314	1.4%	-0.6%
Dickinson	9,231	12,783	13,481	3.3%	1.1%
Emmet	6,053	6,732	6,606	1.1%	-0.4%
Palo Alto	5,346	5,786	5,429	0.8%	-1.3%
Region Total	43,744	51,561	51,575	1.7%	0.0%

Figure 4 clearly shows the pattern of change in total jobs and people realized by the region as shares of the state totals. Although both trended down together through most of the 1980s and the 1990s, regional job shares increased in the current decade while population continued its decline. The job share is now above the population share. There are two explanations for this: (1) the region, compared to surrounding areas is attractive for job creation and is able to rely on more incommuters than would be expected, or (2) the region is adding jobs, but those jobs are not sufficient to offset the population erosions. This latter consideration is often an indication that the wage level of new jobs is, on average, below the regional average.

Figure 4

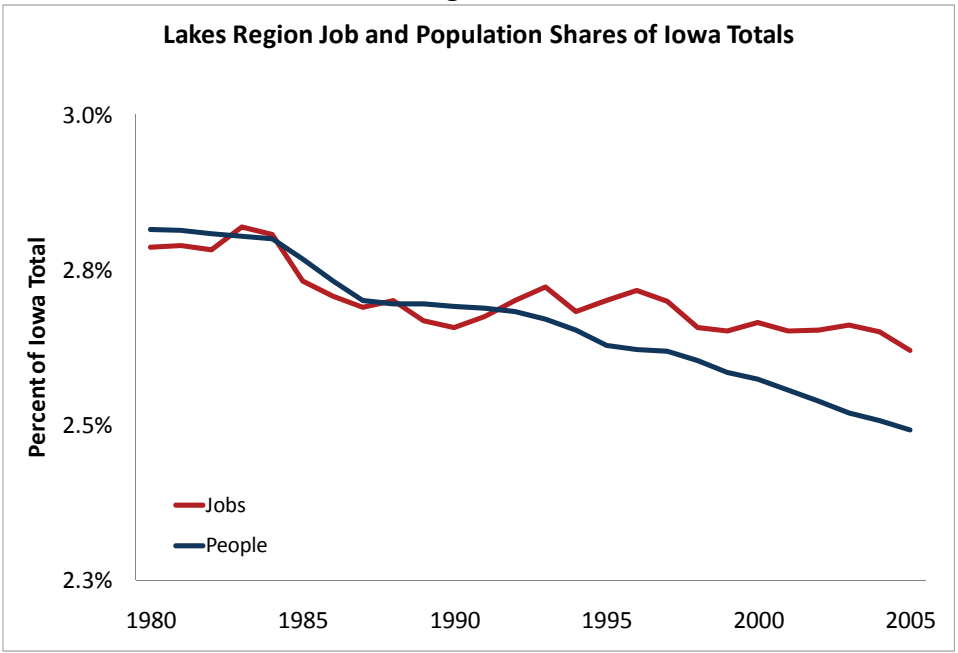
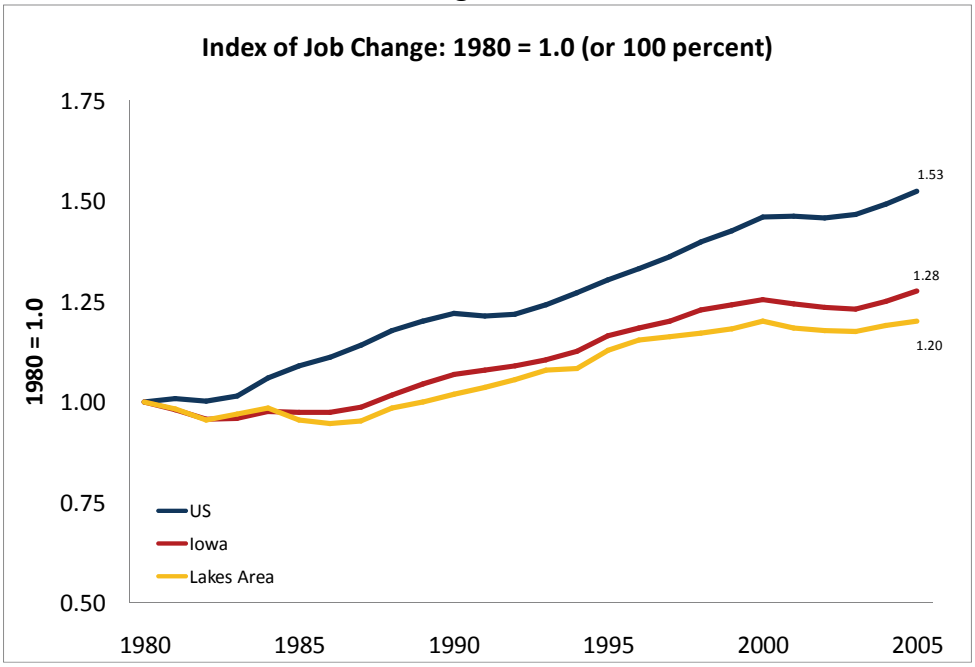


Figure 5 tracks the total rate of job growth for the U.S., Iowa, and the region over the past two decades. In this graph, 1980 values equal 1 (or 100%), and the plots track patterns of change since that origin. We see that the state and the region diverged from the national pattern of change through the mid 1980s, and that the region then followed the national pattern through the late 1990s. We also see that the pace of growth since has slowed for Iowa and the region. Over the 25 years measured, the nation's jobs grew by 53 percent, the state's jobs increased by 28 percent and the region's by 20 percent.

Figure 5



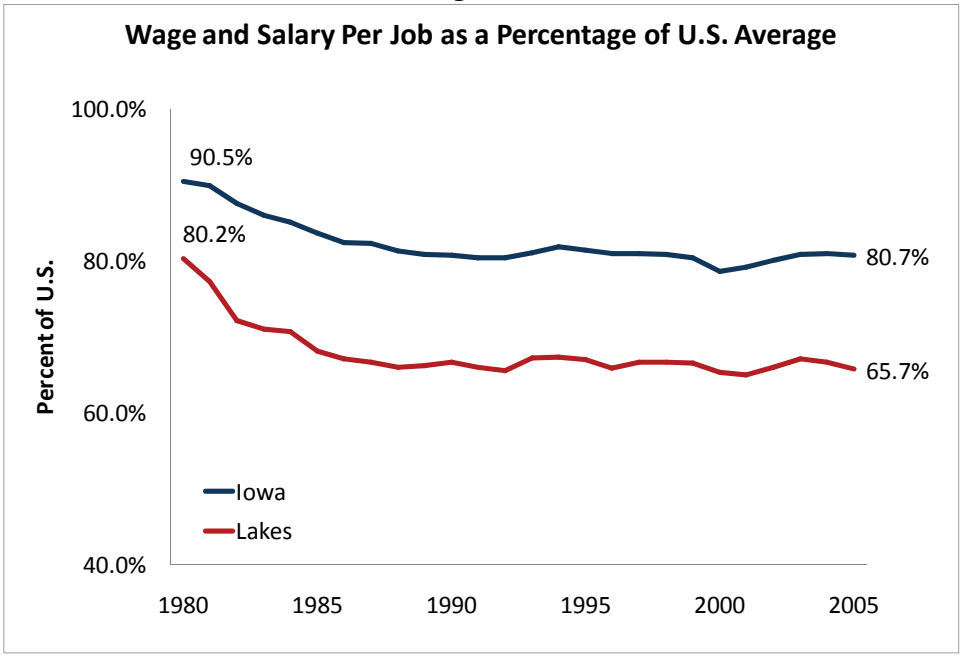
Worker Earnings

Figure 6 allows us to see what has happened to the average earnings of workers in Iowa and in the region when compared to the U.S. averages. In 1980, the region's workers earned just over 80 percent of the U.S. average pay per job, while the state was at 90.5 percent. The state has eroded by nearly 10 percentage points since to 80.7 percent, but the region's share has eroded by nearly 15 percentage points to 65.7 percent. While the state has lost ground to the nation, the region has also lost ground to the state.

Average earnings per worker are an important component of maintaining the livability and desirability of a region. In general, workers migrate to where they feel they will be able to maximize their earnings chances, to include appreciable gains in the values of their net worth (as usually measured by housing investment and retirement accumulations). Depressed regional earnings are generally a hindrance to business development efforts. This may seem counter-intuitive to some, but the situation usually is this: an area with depressed earnings likely will be exporting its skilled labor to regions with better earnings. Businesses that are sensitive to labor costs might seem to be initially attracted to an area where the prevailing wage level is low. In fact, however, firms will often find that the pool of workers in such areas has skill and education deficiencies. In short, wages notwithstanding, workers go to where they can get a good

return on their labor, and firms go to where there are workers. This simultaneous dynamic generally works against many rural economies and thwarts much of their economic development initiatives.

Figure 6



Next, a few words about small businesses and entrepreneurship: In recent years, the state of Iowa has posted the lowest rates of new firm startups in the nation, but it also has posted the lowest rate of firm failures in the nation. The consensus among analysts is that the state, its people and investors, tend to be highly conservative and careful about starting new businesses.

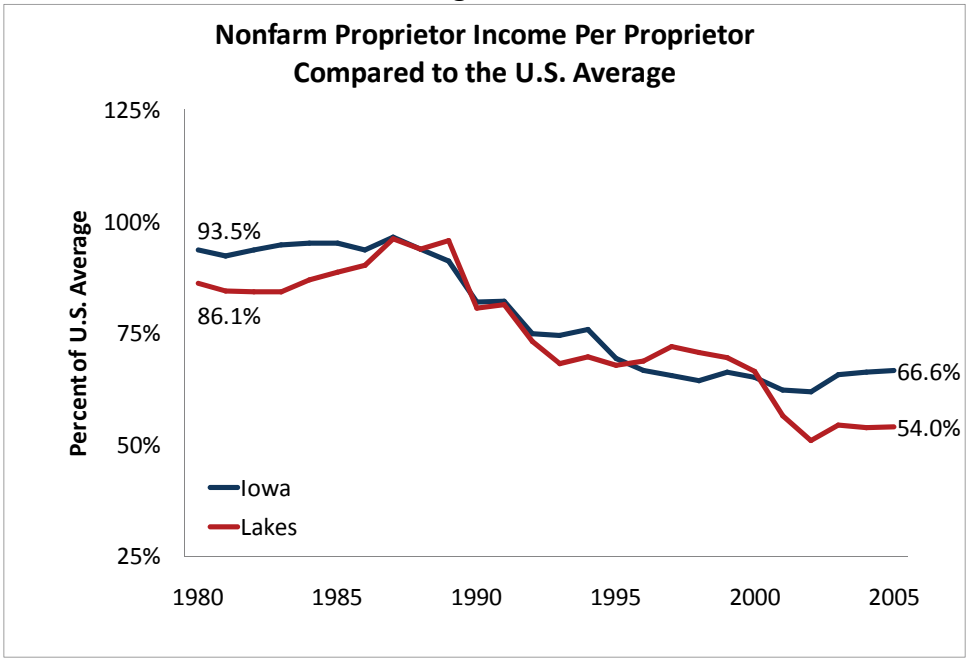
The overall returns to small business ownership can be measured in a number of ways, but the Bureau of Economic Analysis does measure both the incidence of nonfarm proprietors (either sole proprietors or simple partnerships) and the annual income that they generate. Those values are displayed in Figure 7 below.

The findings are dramatic. In 1980, the average Iowa nonfarm proprietor had an income per proprietorship that was about 93.5 percent of the U.S. average. In the Lakes region, that average was 86.1 percent. Those relative positions held until the 1980s when Iowa and the Lakes region values plummeted. By 2005 the state average was just 66.6 percent and the percentage in the Lakes region fell to 54 percent. This erosion in

returns to nonfarm proprietorships is both puzzling and troublesome. It implies much lower returns to entrepreneurship, which helps to explain the very low rate of business startups.

It is likely that the data in Figure 6 help to explain just what is going on in Figure 7. If, overall, average earnings are depressed in the state and generally considered substandard, then workers and households must (1) increase the number of jobs that are part of that household or (2) begin a side business to help supplement family incomes. As the side business is a supplement to earnings and not the primary source of earnings, then the averages are to be expected to be low. Still, the two sets of statistics taken together are quite bothersome for the state as a whole and for this region in particular.

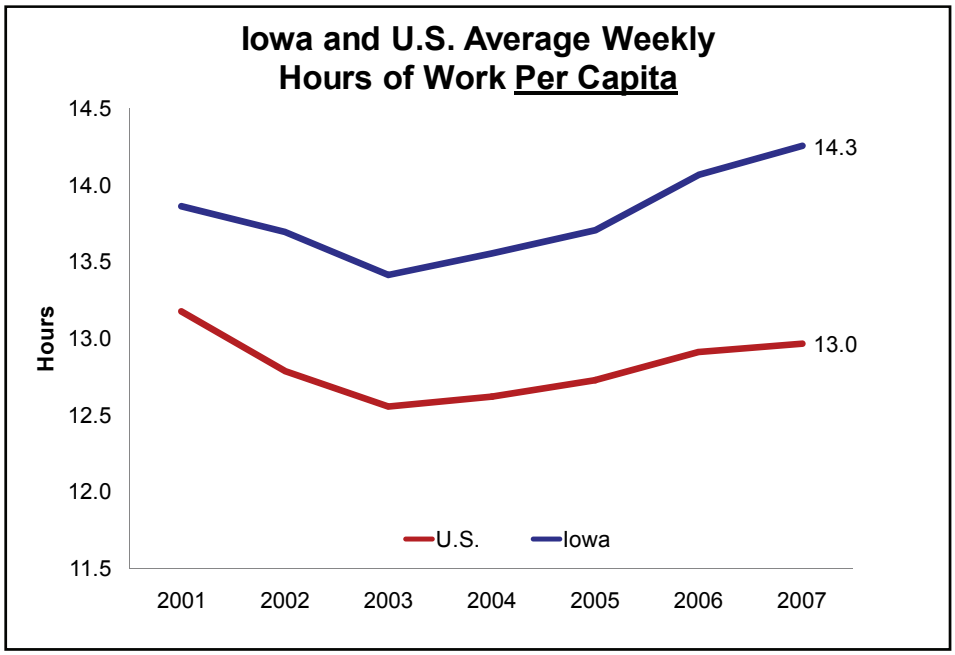
Figure 7



The upshot is that Iowa households have to work more jobs and more hours to maintain their household income levels. This pattern is illustrated starkly in the following graph. In Figure 8 the average number of nonfarm work hours per week per capita are measured and compared to the U.S. average. Over the course of this decade, Iowans have worked consistently more hours per capita than the national average and the gap between Iowa and the U.S. is widening in recent years. In 2007 it is estimated that the average hours worked per capita in Iowa were 10 percent greater. This graph actually

understates the situation. First, it does not include farm hours worked, an area where Iowa has a competitive advantage over the nation. Those hours are not in the numerator while the farm families are in the denominator. Second, Iowa has a higher proportion of non-working elderly than the nation which inflates its denominator. Perhaps more noteworthy, though, has been the strong increase in the slope in recent years compared to the U.S. There are no comparable data at the county level so we cannot make estimates for the Lakes region.

Figure 8



III. Regional Industrial Summary

This section profiles the comparable size and broad industrial composition of the Lakes area economy. Table 6 lists several measures of industrial activity. These data are derived from an input-output summary of the regional economy that was compiled by a non-governmental source.* The data are presented in concordance with the North American Industrial Classification schema at the "2-digit" level, which allows us to identify the major sectors of the regional economy.

In 2006, according to this summary, there were 49,036 jobs in the region producing $6.124 billion in industrial output. Industrial output is, roughly, the sales value of all production by all industries and governments in the area. Payroll to workers in the region was $1.32 billion, returns to sole proprietors were $277.3 million, payments made to investors were $804.5 million, indirect tax payments to governments was $185.8 million, and total value added, the sum of the preceding four categories, was $2.59 billion. All manufacturing accounted for $2.45 billion of the region's output, followed by agriculture at $802.5 million. All governments came in a very distant third in this category with $571.8 million in output value. The top five sectors for jobs were manufacturing at 7,447, governments at 6,668, all agriculture at 4,384, health and social services at 4,295, and accommodation and food services at 3,620.

* The data for this region were compiled by the Minnesota Implan Group, Inc. This company provides estimates of industrial data summarized down to the county level. These data are based largely on existing U.S. Bureau of Labor Statistics, Bureau of Economic Analysis, and Census Bureau data sets that are compiled annually or quinquennially by federal agencies. Gaps in data are filled using "clean and structure" techniques to estimate missing data by apportioning broad categorical remainders into categories where data were either missing or suppressed. As a consequence, some of the industrial details in more highly disaggregated tables are estimates.

Table 6. Summary Industrial Accounts for the Lakes Region, 2006

All financial amounts in millions			+	+	+	+	=
	Total Industrial Output	Jobs	Employee Compensation	Proprietor Income	Other Property Income	Indirect Business Taxes	Value Added
Ag, Forestry, Fish & Hunting	802.493	4,384	36.814	90.537	115.074	13.099	255.524
Mining	22.274	82	0.904	2.524	2.981	0.456	6.866
Utilities	95.692	229	15.874	3.062	36.045	10.044	65.025
Construction	265.184	2,458	72.436	25.918	13.435	1.455	113.245
Manufacturing	2,451.02	7,447	327.807	37.53	175.967	13.622	554.925
Wholesale Trade	214.764	1,687	68.133	12.96	31.789	31.765	144.647
Transportation & Warehousing	150.811	1,596	44.26	14.492	12.787	2.778	74.317
Retail trade	367.595	6,855	121.746	23.113	39.999	49.348	234.206
Information	86.88	543	16.131	0.44	9.405	2.615	28.591
Finance & insurance	203.27	1,155	50.36	4.488	79.123	2.891	136.862
Real estate & rental	120.938	1,340	7.277	13.017	47.429	13.968	81.691
Professional- scientific & tech	111.983	1,285	31.806	17.587	4.551	0.993	54.937
Management of companies	5.101	46	1.474	-0.002	0.395	0.03	1.898
Administrative & waste services	78.405	1,753	24.182	5.204	6.72	1.048	37.155
Educational	25.326	651	10.22	0.469	0.405	0.056	11.15
Health & social services	258.44	4,295	123.864	12.813	14.563	2.046	153.287
Arts- entertainment & recreation	30.459	671	7.256	2.203	3.802	1.704	14.965
Accommodation & food services	156.967	3,620	42.691	2.575	15.209	7.85	68.324
Other services	105.031	2,270	34.196	8.377	1.015	3.891	47.478
Government & non NAICs	571.796	6,668	283.819	0	193.779	26.096	503.694
Totals	6,124.42	49,036	1,321.25	277.306	804.473	185.755	2,588.79

Table 7 shows just how dominant manufacturing and agriculture were in the Lakes region economy in 2006. Manufacturing was 40 percent of industrial output (the value of gross sales), and agriculture followed at 13.1 percent. Output, however, is a crude measure of industrial activity in a region. It is more appropriate to use either jobs or value added to gauge the overall importance of industrial activity to a region and its communities.

Using these more standard measures, manufacturing produced 15.2 percent of the region's jobs and yielded 21.4 percent of its value added. Agriculture produced 8.9 percent of jobs and 9.9 percent the regional value added. The second highest share of value added was found in the government sector at 19.5 percent. Because the value added percentage is above the jobs percentage in manufacturing, the returns of these jobs to workers and to investors were comparatively higher than most of the remaining sectors of the Lakes regional economy (wages to workers and payments to investors are the bulk of value added). The retail sector is the second most prevalent industry in terms of jobs at 14 percent but only generates 9 percent of value added. The worst

ratios of value added to jobs are found in entertainment and recreation, accommodation, and all other services.

Table 7. Summary Industrial Accounts for the Lakes Region, 2006, as Percentages of Regional Totals

	Total Industrial Output	Jobs	Value Added
Ag, Forestry, Fish & Hunting	13.1%	8.9%	9.9%
Mining	0.4%	0.2%	0.3%
Utilities	1.6%	0.5%	2.5%
Construction	4.3%	5.0%	4.4%
Manufacturing	40.0%	15.2%	21.4%
Wholesale Trade	3.5%	3.4%	5.6%
Transportation & Warehousing	2.5%	3.3%	2.9%
Retail trade	6.0%	14.0%	9.0%
Information	1.4%	1.1%	1.1%
Finance & insurance	3.3%	2.4%	5.3%
Real estate & rental	2.0%	2.7%	3.2%
Professional- scientific & tech	1.8%	2.6%	2.1%
Management of companies	0.1%	0.1%	0.1%
Administrative & waste services	1.3%	3.6%	1.4%
Educational	0.4%	1.3%	0.4%
Health & social services	4.2%	8.8%	5.9%
Arts- entertainment & recreation	0.5%	1.4%	0.6%
Accommodation & food services	2.6%	7.4%	2.6%
Other services	1.7%	4.6%	1.8%
Government & non NAICs	9.3%	13.6%	19.5%
Totals	100.0%	100.0%	100.0%

The preceding table allows us to gauge sectoral strength in the regional economy; Table 8 shows which counties accounted for which components of industrial activity in the region. Buena Vista had 35 percent of the output, nearly 27 percent of the jobs, and 29.2 percent of the value added. Clay County had a quarter of all jobs and value added, but only 20 percent of industrial output. Again, comparatively, areas where the value added share exceeds the jobs share are areas where productivity is higher per job and compensation is higher than the regional average. The gap between value added and jobs is relatively small in all of the counties with only Buena Vista's value added percentage exceeding its jobs by a substantial margin.

Table 8. Industrial Summaries by County or Area

Summary all Counties	Total Industrial Output	Jobs	Value Added
Buena Vista	34.9%	26.8%	29.2%
Clay	20.0%	25.2%	25.1%
Dickinson	21.6%	24.1%	23.2%
Emmet	11.6%	12.0%	11.4%
Palo Alto	12.0%	11.8%	11.1%
Region	100.0%	100.0%	100.0%

Table 9 compares the major industrial values found in the Lakes region to those of the state of Iowa. This table is very instructive and gives a good general idea of the region's comparative strengths and weaknesses *vis à vis* the state of Iowa. The first set of values to understand are the column totals. These are "expected" values. They represent the region's total shares of state activity in the categories measured. The region had 2.4 percent of the state's industrial output, 2.5 percent of jobs, and paid out 2.2 percent of the state's value added. These, for each column, are the expected values for the region.

Now that we know the expected values, we can look to where the region has categorical strengths and weaknesses. Values in green are areas that were a half of a percentage point than the expected values. Those in red shading are a half a percentage point or more below the expected values.

Overall, broadly, the region has strengths in agriculture, mining, manufacturing, retail trade, and accommodation industries. It has comparative weaknesses in transportation and warehousing, financial and information industries, and in most of the professional, health and social, and other service categories. All other sectors are, plus or minus, relatively close to the expected values.

Table 9. Summary Industrial Accounts for the Lakes Region, 2006, as Percentages of State Totals

Lakes Region	Total Industrial Output	Jobs	Value Added
Ag, Forestry, Fish & Hunting	5.3%	3.4%	5.4%
Mining	3.6%	3.0%	2.6%
Utilities	2.9%	3.2%	2.6%
Construction	2.2%	2.3%	2.1%
Manufacturing	2.7%	3.2%	2.5%
Wholesale Trade	2.0%	2.3%	2.0%
Transportation & Warehousing	1.7%	2.0%	1.6%
Retail trade	2.9%	3.0%	2.9%
Information	1.1%	1.5%	0.9%
Finance & insurance	1.0%	1.1%	1.2%
Real estate & rental	2.2%	2.8%	2.3%
Professional- scientific & tech svcs	1.5%	1.8%	1.5%
Management of companies	0.2%	0.4%	0.2%
Administrative & waste services	1.8%	2.0%	1.5%
Educational svcs	1.4%	1.6%	1.1%
Health & social services	1.9%	2.2%	1.9%
Arts- entertainment & recreation	1.9%	1.9%	1.6%
Accomodation & food services	2.9%	3.0%	2.8%
Other services	2.2%	2.3%	2.0%
Government & non NAICs	2.5%	2.6%	2.4%
Totals	2.4%	2.5%	2.2%

The preceding table gave a general, albeit aggregated, indication of regional competitive strengths. Table 10 below gives a much more detailed indication of regional specialization. It calculates a specialization index for each displayed category as compared to the state of Iowa. If an industry scores a 1.0, then it is producing relative to the total value in that category, at the state average level as a fraction of all production. A value greater than 1.0 indicates specialization. A value less than 1.0 indicates an absence of specialization. In the table cells shaded in green indicate 25 percent more specialization than would be expected. Cells shaded red indicate 25 percent less than would be expected. Industries not in evidence in the region were deleted. All other un-shaded cells range from .75 to 1.25 in value and would be considered within generally normal ranges for a region as compared to the state. This table, by color, readily shows regional competitive advantages within the state (the

green areas), average areas (the unshaded areas), and areas where the region, overall, is industrially under-represented (the red shaded spaces).

This greater detail shows that indeed the region has a lot of specialization in all aspects of agriculture. It also demonstrates the region's strengths and deficits in manufacturing. Food and food related processing is strong, as are textiles and printing along with transportation and furniture manufacture. The region shows, compared to Iowa, deficits in the proportion of many other manufacturing categories.

The region also demonstrates some strength in several retail categories. Part of this is attributable to the distribution of trade centers, and part is attributable to the preponderance of small towns with, relatively, small stores. In contrast, the region demonstrates deficits in most information, financial, and service categories except for nursing and residential care services and accommodations.

Table 10.

Lake Region Industrial Competitiveness Compared to the State of Iowa

Industry	Output	Jobs	Value Added
Crop Farming	2.06	1.15	2.25
Livestock	2.36	1.50	3.23
Forestry & Logging	1.76	1.72	1.75
Fishing- Hunting & Trapping	2.91	2.76	3.47
Ag & Forestry	1.80	1.68	1.98
Mining	0.86	0.76	1.03
Mining services	0.67	1.62	0.52
Utilities	1.18	1.29	1.15
Construction	0.90	0.91	0.94
Food products	1.81	2.60	1.83
Beverage & Tobacco	0.03	0.04	0.02
Textile Mills	1.58	1.40	1.17
Apparel Mfg	0.02	0.02	0.02
Wood Products	0.99	1.10	0.95
Printing & Related	2.00	2.30	2.35
Petroleum & coal processing	1.66	0.47	2.75
Chemical Manufacturing	1.16	0.49	2.07
Plastics & rubber prod	0.12	0.14	0.12
Nonmetal mineral prod	0.46	0.59	0.43
Primary metal mfg	0.26	0.78	0.43
Fabricated metal prod	0.58	0.62	0.63
Machinery Mfg	1.01	1.19	1.09
Computer & other electronic	0.06	0.05	0.08
Electrical equip & appliances	0.07	0.14	0.05
Transportation equip	1.57	1.08	1.57
Furniture & related prod	2.04	2.94	1.74
Miscellaneous mfg	1.19	1.06	1.31
Wholesale Trade	0.83	0.93	0.90
Air transportation	0.15	0.19	0.01
Rail Transportation	0.21	0.20	0.23
Water transportation	0.14	0.24	0.08
Truck transportation	0.80	0.87	0.79
Transit & ground passengers	1.46	1.50	1.54
Pipeline transportation	0.68	0.65	0.73
Sightseeing transportation	1.74	1.51	1.89
Postal service	0.82	0.89	0.86
Couriers & messengers	0.42	0.57	0.40
Warehousing & storage	0.45	0.37	0.50
Motor veh & parts dealers	1.19	1.28	1.27

Table 10 (Continued)

Lake Region Industrial Competitiveness Compared to the State of Iowa

Industry	Output	Jobs	Value Added
Furniture & home furnishings	1.30	1.50	1.38
Electronics & appliances stores	1.02	1.33	1.11
Bldg materials & garden dealers	1.41	1.56	1.48
food & beverage stores	1.32	1.16	1.48
Health & personal care stores	0.81	0.83	0.87
Gasoline stations	1.57	1.26	1.71
Clothing & accessories stores	0.75	0.88	0.81
Sports- hobby- book & music stores	0.55	0.76	0.52
General merch stores	1.26	1.18	1.39
Misc retailers	1.48	1.66	1.61
Non-store retailers	0.93	1.14	1.01
Publishing industries	0.30	0.60	0.30
Motion picture & sound recording	1.79	1.83	1.35
Broadcasting	0.65	0.76	0.60
Internet & data process	0.02	0.02	0.02
Credit inter-mediation & related	0.10	0.11	0.11
Securities & other financial	0.43	0.42	0.47
Insurance carriers & related	0.11	0.22	0.16
Monetary authorities	1.10	1.05	1.20
Real estate	1.05	1.22	1.14
Rental & leasing	0.51	0.69	0.47
Professional- scientific & tech	0.64	0.71	0.68
Management of companies	0.10	0.14	0.07
Admin support	0.74	0.80	0.70
Waste mgmt & remediation	0.76	1.00	0.56
Educational	0.57	0.66	0.51
Ambulatory health care	0.77	0.81	0.83
Hospitals	0.42	0.47	0.40
Nursing & residential care	1.38	1.36	1.49
Social assistance	0.86	0.74	1.04
Performing arts & spectator sports	0.95	0.64	0.66
Museums & similar	0.80	1.17	0.65
Amusement- gambling & recreation	0.73	0.84	0.75
Accommodations	1.36	1.65	1.34
Food & drinking places	1.14	1.13	1.21
Repair & maintenance	0.95	1.10	0.91
Personal & laundry	0.88	1.00	1.00
Religious- grantmaking- & similar orgs	0.80	0.78	0.82
Private households	0.90	0.81	0.98
Government & non NAICs	1.02	1.06	1.08

IV. Characteristics of Industrial Production

Regional Input and Output Summaries

The regional economy for the five-county area can be parsed into its constituent inputs and outputs. In so doing we introduce readers to the elements of economic activity in the region. All of these data come from an input output model of the regional economy for 2006. That is the latest year for which estimates of the regional economy are available. This data set, however, is very appropriate for the modern economy because it does contain the recent additions of biofuels and casino operations to the region.

Total inputs in an economy always equal total outputs. Table 11 isolates the overall inputs and outputs of the Lakes region. That amount is $6.124 billion. In producing that output, regional industries made $3.54 billion in payments for production inputs, nearly two-thirds of which were imported. Next the region made payments to value added in the amount of $2.6 billion. Payments to workers and proprietors combined form labor income and represent 61.7 percent of all value added. Payments to investors and property owners are 31 percent of value added, with the remaining amount going to make indirect tax payments that are part of the production process in the region.

The table also lets us see how the outputs of the region are distributed. Local industries purchase an estimated $1.21 billion of the region's output, and the remaining $4.933 billion go to the final demanding sectors. The largest final demand category is exports at 58.7 percent of the total, followed by regional households at 23.2 percent, governments purchases are 9.7 percent of final demand, and the remaining 8.3 percent go to inventory and capital.

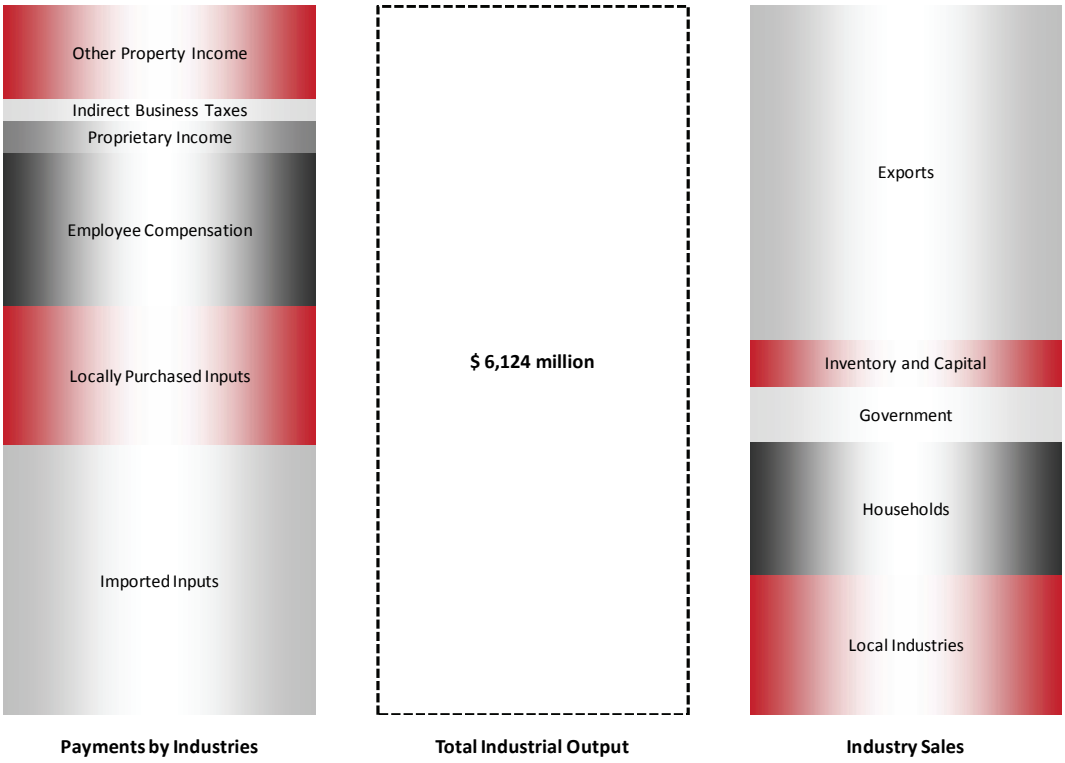
This table is useful for understanding what makes a regional economy tick. Income in a region is a function of all local consumption by households and industries plus all exports, minus all imports.

An alternative characterization of inputs and outputs is displayed in Figure 9. It is based on the data from Table 11 and gives a visual sense of the size of inputs and the size of outputs from regional industries.

Table 11
Components of Industrial Output
Lakes Region, 2006

		$ millions	% of total
Industrial Inputs	Imported Inputs	2,323.9	
	Local Inputs	1,211.8	
	Total Industrial Inputs	**3,535.6**	
plus			
Value Added	Employee Compensation	1,321.3	51.0
	Proprietary Income	277.3	10.7
	Indirect Business Taxes	185.8	7.2
	Other Property Income	804.5	31.1
	Total Value Added	**2,588.8**	**100.0**
equals			
Industrial Output	Total Output	**6,124.4**	
sold to			
Intermediate	Local Industry Demand	**1,205.6**	
and			
Final Demands	Households	1,146.3	23.2
	Government	480.1	9.7
	Inventory and Capital	409.1	8.3
	Exports	2,897.1	58.7
	Total Final Demands	**4,932.6**	**100.0**

Figure 9
Components of Industrial Output in the Lakes Region



Measuring Output and Productivity

Table 12 re-summarizes the basic components of industrial output for the region that are already contained in Table 6 (in the previous section). It, however, compiles those data on a per job basis as a measure of overall productivity. Productivity and rankings are listed for output, value added, and earnings, a subset of value added. The standard measure of productivity (or gross domestic product) is value added per job. By that measure, the finance, insurance, and real estate sectors had the highest productivity, followed by wholesale, and transportation and utilities. Services and retail trade yield the lowest productivity. When that measure is applied just to the earnings levels of workers, then the manufacturing sector has the highest measure, followed by wholesale trade. All other services post the lowest measure of earnings per job, followed by retail. Value added productivity is 96 percent of the state level. Earnings productivity is 92 percent of the state average. Earnings are the wages and salaries of workers, plus the value of all work-related benefits, plus the returns to sole proprietors.

Table 12
Contributions by Industrial Sector
Lakes Region, 2006
Average Output, Value Added, and Earnings per Job

Industry Group		Output		Value Added		Earnings	
		$ Per Job	Rank	$ Per Job	Rank	$ Per Job	Rank
Agriculture and Mining		184,676	*2*	58,753	*5*	29,283	*9*
Construction		107,842	*7*	46,053	*7*	39,998	*5*
Manufacturing		329,261	*1*	74,547	*4*	49,078	*1*
Wholesale Trade	[1]	127,305	*6*	85,742	*2*	48,069	*2*
Retail Trade	[1]	53,640	*9*	34,176	*9*	21,138	*10*
Transportation and Utilities		134,997	*4*	76,310	*3*	42,545	*3*
Communications and Information		160,002	*3*	52,656	*6*	30,517	*7*
Finance, Insurance, and Real Estate		130,047	*5*	87,667	*1*	30,141	*8*
Professional and Social Services	[2]	63,503	*8*	35,202	*8*	31,573	*6*
Other Services		46,334	*10*	20,761	*10*	15,545	*11*
Government	[3,4]					42,452	*4*
Average, All Industries**		**124,907**		**52,798**		**32,602**	
Average, State of Iowa	**4**	**117,583**		**54,845**		**35,496**	

[1] Values for the wholesale and retail trade sectors reflect only their trade margins on the goods they purchase and resell.

[2] Private sector education and health services are included in the professional and social services group.

[3] Household and government enterprises engage in activities resembling those of business entities. Household transactions include private households employing workers in activities primarily concerned with the operation of the household; transactions between households for used and secondhand goods; and the imputed rental value received by households for their owner-occupied dwellings. Government enterprises include public utilities, passenger transit, and other public enterprises with characteristics of business entities.

[4] Government output and value added measures are not comparable with private industries; therefore, total government output, output per job and average value added per job values are not reported.

** All-industry average output and value added per job includes values for household and government enterprises and the government sector. This may deflate the average output per job values in regions with relatively high concentrations of government employment.

Table 13 shows the composition of industrial outlays for each major industrial sector in the region. This shows where regional industries make payments as part of their production process and compares them to one another. Statewide averages are included for comparison; however, differences from the state should be interpreted with caution. The region, by virtue of its smaller size, is relatively more dependent on imported inputs (38.7 percent) than the state (30.7 percent). Within the region, the agriculture and manufacturing sectors are both more dependent on imported inputs than other sectors. Payments to employment compensation represent relatively higher fractions of inputs in the services and retail sectors. The finance and real estate sector (FIRE) stands out with its relatively high proportion of input payments to other property incomes (39 percent). This is due primarily to the heavy emphasis on farming and the farmland rental payments accrue to that sector.

Table 13
Composition of Industry Outlays by Major Sector
Lakes Region, 2006

Major Sector *(sum across to 100%)*	Percentage of total outlays by sector						
	Industrial Inputs		Value Added Inputs				
	From Local Industries	Imported Inputs	Employee Comp.	Proprietary Income	Other Property Income [4]	Indirect Business Taxes [5]	*All Production Inputs*
Production Agriculture	22.4	46.2	3.7	11.2	14.8	1.6	*100.0*
Other Agriculture & Mining [1]	18.6	40.7	21.3	13.1	4.9	1.5	*100.0*
Construction	18.6	38.7	27.3	9.8	5.1	0.5	*100.0*
Manufacturing	24.9	52.4	13.4	1.5	7.2	0.6	*100.0*
Wholesale Trade [2]	12.6	20.1	31.7	6.0	14.8	14.8	*100.0*
Retail Trade [2]	13.9	22.4	33.1	6.3	10.9	13.4	*100.0*
Transportation & Utilities	15.5	28.0	24.4	7.1	19.8	5.2	*100.0*
Comm. & Information	29.0	38.1	18.6	0.5	10.8	3.0	*100.0*
F.I.R.E.	14.2	18.4	17.8	5.4	39.0	5.2	*100.0*
Services	20.1	29.7	35.6	6.2	6.1	2.3	*100.0*
Other Enterprises [3]	9.2	14.9	6.2	0.5	59.9	9.2	*100.0*
Government	27.9	29.0	39.5	0.0	3.6	0.0	*100.0*
Average for All Sectors	21.5	38.7	20.3	4.3	12.4	2.9	*100.0*

Comparative Values for the State of Iowa, 2006

Major Sector *(sum across to 100%)*	Percentage of total outlays by sector						
	Industrial Inputs		Value Added Inputs				
	From Local Industries	Imported Inputs	Employee Comp.	Proprietary Income	Other Property Income [4]	Indirect Business Taxes [5]	*All Production Inputs*
Production Agriculture	30.0	39.3	4.7	11.4	12.8	1.8	*100.0*
Other Agriculture & Mining [1]	20.0	32.8	26.7	11.9	7.0	1.6	*100.0*
Construction	23.1	32.5	29.3	9.3	5.3	0.6	*100.0*
Manufacturing	30.4	45.3	14.8	0.6	8.2	0.6	*100.0*
Wholesale Trade [2]	17.0	15.6	34.6	3.2	14.8	14.8	*100.0*
Retail Trade [2]	18.8	17.1	35.7	3.7	11.2	13.4	*100.0*
Transportation & Utilities	16.9	24.1	31.2	3.8	19.9	4.2	*100.0*
Comm. & Information	26.2	31.8	22.6	1.2	15.3	2.9	*100.0*
F.I.R.E.	23.1	20.3	23.5	3.6	25.0	4.5	*100.0*
Services	23.9	22.9	38.7	5.5	7.0	2.0	*100.0*
Other Enterprises [3]	10.1	9.8	5.4	0.5	64.1	10.1	*100.0*
Government	30.2	21.5	44.3	0.0	4.0	0.0	*100.0*
Average for All Sectors	25.6	30.7	24.7	3.1	12.9	3.0	*100.0*

[1] Includes forestry, fishing, hunting, and agricultural support services.
[2] Industrial inputs for the wholesale and retail sectors exclude the trade goods that they purchase for resale.
[3] Other enterprises include activities by households and governments that resemble those of business entities.
[4] Other property income includes rents, royalties, dividends, and corporate profits.
[5] Indirect business taxes include excise, sales, and property taxes, but not income taxes.

Figure 10 itemizes the top 20 production inputs for the region and differentiates between estimated imports and those that are regionally supplied. Livestock imports, both into agriculture and into meat processing are a primary regional production input at an estimated $596.1 million, with a substantial fraction expected to be supplied by local producers. The vaguely defined wholesale sector is a distant second at $208 million, followed by real estate services, crops, and refined petroleum owing to the region's heavy dependence on energy inputs.

Figure 10
Top 20 Inputs to Regional Industrial Production
Lakes Region, 2006

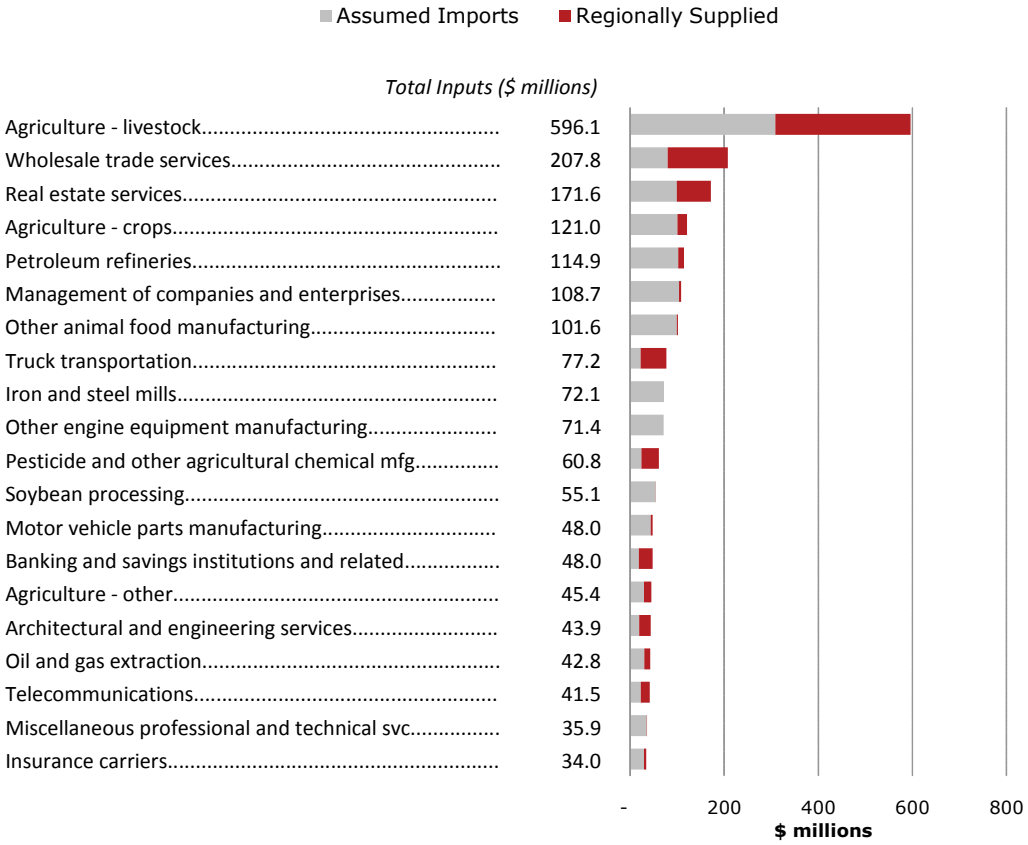
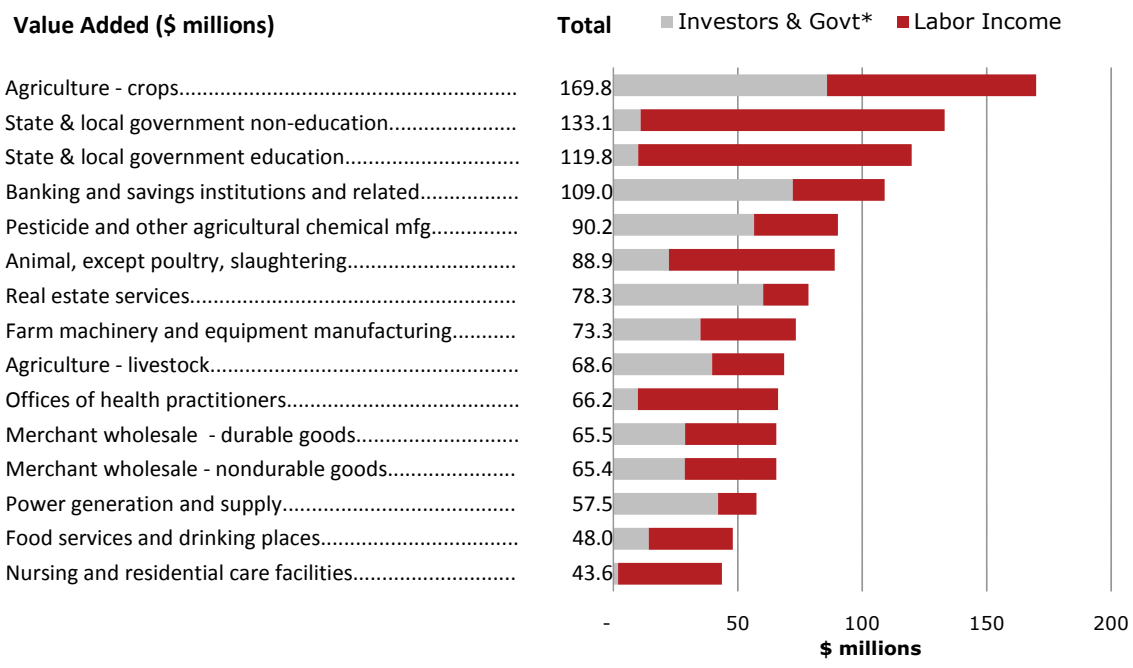


Figure 11 displays the region's top 15 industries in total value added production. That amount is divided into labor income, the earnings of workers and returns to proprietors, into investors' incomes (dividends, interests, and rents) and indirect payments to governments. The labor income portion is very important because that aspect of value added remains in the region and is most readily converted into household income.

Crop farming leads with $170 billion in value added. Next at $133 and $120 million respectively are state and local government non-education and education sectors. Fourth is the banking sector. Manufacturing occupies the 5th, 6th, and 8th positions. Sectors where it is clear that labor income is the preponderance of value added are government, the meat packing industry, health practitioners, wholesale, food and drinking places, and nursing care.

Figure 11
Top 15 Industries Ranked by Total Value Added
Lakes Region, 2006



*Other Property Income + Indirect Business Taxes

Top Regional Imports

Earlier it was shown that the region was estimated to have $2.32 billion in commodity and service imports. Table 14 lists the estimated values of the top 15 imports into production for the region. Animal imports at $305 million are three times the values of the next categories of company and enterprise management, petroleum refineries, animal food manufacturing, and real estate services.

A more detailed assessment of imports later in this study will allow for an investigation of the possibility that import demand is sufficient to pursue the development of import substituting industries. From this aggregated list, however, it is evident that many of the commodities that must be imported into the region are specialized goods that cannot be produced locally.

Table 14. Top 15 Commodities or Services Imported Into the Lakes Region, 2006

(listed by industries in which they are produced)

Commodity or Service	Imports in $ millions
Animal production, except poultry and eggs	305.2
Management of companies and enterprises	103.9
Petroleum refineries	102.1
Other animal food manufacturing	99.5
Real estate services	99.4
Wholesale trade services	79.8
Iron and steel mills	72.1
Other engine equipment manufacturing	71.4
Soybean processing	54.2
All other crop farming	44.4
Motor vehicle parts manufacturing	43.9
Grain farming	36.1
All other miscellaneous professional and technical services	35.4
Oil and gas extraction	30.0
Insurance carriers	29.9

V. Identifying Regional Key Industries

An important objective of industrial targeting research is to help economic development planners to zero-in on an area's production, trade, and service strengths and to assist in identifying emerging industries. Some economic development planning is analogous to a personal investment strategy where investors attempt, via research and experience, to place their resources into investments that will balance their expectations for growth against their respective tolerances for risk. An investor would not seriously think about putting funds into a category that research indicated might not grow in the near future. Smart investors would be careful about fads and bandwagons. Finally, investors would move resources away from categories that were likely to decline. Economic developers must think along the same lines. The mix of industrial opportunities is very much like a mix of stock choices.

This analogy to economic development is apt, but only to a point. Regional economic development planners are not in charge of, nor do they have the power to influence, the whole regional economy. To pretend so would be silly, if not arrogant. Instead, economic development practitioners have an opportunity to steer both public and private investment dollars and activities into areas that may accomplish one of several important economic development goals. For example, developers may wish to

- Encourage the diversification of industrial production in an area to offset historic patterns to help move the regional industrial mix into the direction of the state or national economy,

- Capitalize on existing industrial strengths and use those strengths to leverage similar industries or industries that link well with that historical base,

- Nurture nascent industrial activity appearing to hold promise or further the development of regional or sectoral niche industries,

- Search for new firms that allow for more efficient utilization of existing private and public infrastructure such as private and public transportation, storage, energy production capacity, and municipal utilities. Regional education capacity could also be considered in this instance.

- Enhance the average earnings potential of regional labor force members and the total incomes of the average regional household.

In all of these examples, the economic development planners ideally are using sound industrial, labor force, and other economic research to inform their decisions. They are not transforming the economy regionally, they are working to use scarce public resources in manners that are efficient and offer the potential for desirable economic and social outcomes.

The primary objectives of this portion of the analysis are three-fold:

- Clarify the region's overall industrial strengths
- Identify industries that have a higher potential for locating in the region.
- In so doing, we hope to help identify industries that have comparatively attractive economic development impacts to include,
    - Potential future growth
    - Wage values
    - Efficient utilization of existing private and public capacities
    - Ability to contribute to the regional tax base

The key industry methodology employed in this analysis looks at three main industry selection criteria

- Existing regional competitive advantages
- Growth potential
- Evidence of emerging industries

Organizing the Primary Data Sets

There are two primary sources of data for our analysis. We are employing Minnesota Implan data for our analysis of regional industrial structure and competitiveness. We buy this data set annually, and the data we are currently using are for 2006. Implan data have a high degree of detail and allow us to gain insights into regional industrial composition that is not available from governmental sources. The other major source for regional data is the Quarterly Census of Employment and Wages (QCEW) administered by the Iowa Department of Workforce Development. They are also highly detailed at the county level, and they provide valuable insights into industrial

compositions. Those data, however, must be managed carefully so as not to unintentionally reveal proprietary information about firms in an area.

The first steps in conducting the targeted industry assessments for the region involved setting two key analysis parameters: a reasonable time period for analysis and the level of industrial detail. For the time parameter, we are primarily, regionally, only looking at the 2000 to 2006 period as our era of contemporary change.

The selection of the appropriate level of industrial detail was influenced by structural limitations of the data sets used for analysis. We are relying on Minnesota Implan data as the foundation for our regional industrial social accounts. Those data were compiled using a 1997 North American Industry Classification System (NAICS) basis, which has minor differences from the 2002 NAICS coding structure currently in use by Iowa Workforce Development and other state and federal agencies. Furthermore, the Implan data are organized at several different levels of industrial specification. Some industries are aggregated to the two-digit NAICS level. In other instances the data set contains four, five, and even six-digit industrial classifications. Importantly and beneficial for our purposes, Implan data are highly specific in the manufacturing sector.

Reconciling data set organizational structures required us to align IMPLAN data and the QCEW data sets. A complete set of Implan industrial accounts in the region was collapsed and aggregated at no greater than the NAICS five-digit level, although several industries were aggregated at a lower level. Next, the regional QCEW data sets for our measurement years, 2000 and 2006, were aligned so that they matched the final aggregations of the IMPLAN data set.

Key Industry Selection Process

With our resulting data sets, we looked at all industries in the region using the following potential targeted industry selection criteria:

- Firm size: There were 50 or more jobs in the industry region-wide.
- Regional specialization: The industries' *location quotients (LQ)*, a measure of local industrial specialization, were greater than 1.50 in 2006.
- Absolute employment change: There was evidence of a positive "shift" in employment in an industry in excess of 25 percent, regardless of its location quotient.

The first two selection criteria identify industries that have a significant presence in the region (both in size and in specialization). Job changes calculated in the third category allow us to differentiate industries that are competitive, stable, declining, and emerging.

Location quotients are a standard measure of an area's industrial composition and degree of industrial specialization. Using the U.S. as a basis for comparison, an area's location quotient (LQ) for an industry is simply the percentage of jobs in that industry locally divided by the percentage of jobs in that industry nationally:

$$LQ = \frac{\dfrac{\textbf{Regional jobs in industry } i}{\textbf{Regional total jobs } t}}{\dfrac{\textbf{U.S. jobs in industry } I}{\textbf{U.S. total jobs } T}}$$

A LQ of 1.0 means that an area has the same percentage of jobs in an industry as the national average. A LQ < 1.0 means that there is a regional deficit of jobs in an industrial category, the region does not demonstrate production specialization in that instance. A LQ > 1.0 means that there is evidence of industrial specialization. Our cut-off is 1.50. That means, considering the national experience, industries in the region meeting this criterion have 50 percent or more jobs than the national average would have suggested. The higher the LQ in an industry in a region, the higher the assumed level of specialization.

We also use job growth as a proxy indicator of LQ change. The LQs in our analysis were calculated from the transformed Implan data set for the regional and U.S. economies. We also calculated industrial job shifts for the 2001 to 2006 period using QCEW data. By definition, industries with percentage changes in jobs in excess of the overall national average rate of growth for that same industry over this period of time will have realized an increase in their LQs. Industries with lower growth percentages will have realized a decrease in their LQs. For the short period assessed, the percentage job changes indicate change in industrial competitiveness.

Initial Selection Results

There are three major tables of industrial ratings resulting from our initial, targeted industry selection criteria:

- **Agriculture and food processing industries.** These industries all have more than 50 employees and location quotients (LQs) above 1.5.
- **Other manufacturing.** These firms as well have more than 50 employees and LQs in excess of 1.5.
- **All other industries**. These industries meet the criteria for minimum jobs, but their LQs might be below the cutoff value of 1.5. Instead, for those with lower LQs, they demonstrated job growth of 25 percent or greater since 2000.

Within each table there are nine important industrial characteristic measures.

- **Value added**. This is the same statistic as gross domestic product, and it is the standard way in which industrial size and overall productivity are characterized in the U.S. economy. This number is the amount in millions produced by the industry in 2006
- **Location quotient**. As explained above, the LQ is a measure of the region's degree of production specialization.
- **Local growth**. This measure looks at the percentage of job growth since 2001 for private wage and salary jobs. This helps us to identify emerging industries.
- **Local dispersion**. This is a measure of the overall concentration employment in our counties. Industries with low dispersion are concentrated in one or two counties. Industries with high dispersion are more scattered about the region.
- **Local linkages**. This measure is derived from the IMPLAN data set. It looks at the ratio of jobs that provide inputs into the key industries. For example, if this ratio for an industry was 1.3, that means that for every job in the key industry, there was $3/10^{th}$ of a job in all of the supplying sectors. For every 100 jobs in the key sector, then, there were 30 supplying jobs. The higher this measure, the greater the industry's job linkage to the regional economy.

- **Projected U.S. job growth annually**. Expectations for future annualized growth in the industry at the national level were derived from Bureau of Labor Statistics data sets for the U.S. for 2006 through 2016.

- **Projected U.S. output growth annually**. Output is a measure of the sales value of all production. This measure is of projected real or inflation adjusted growth for the 2006 through 2016 period.

- **Average earnings**. These are the average earnings per job. They are analyzed as a percentage of the state average for that industry.

- **Export jobs**. These are the jobs that are, statistically, producing for export to users outside of the region. The number of export jobs in an industry in the region is (1-1/LQ) X industrial employment.

The critical values for the last seven of these comparison indicators are presented below in Table 15. In all cases, the least desirable indicators are coded red. Indicators that are considered average are grey, and those coded blue indicate a better score. Readers can quickly scan the tables to see which industries have the highest indicators by category, or they can refer back to this table to identify the cut-off values.

Table 15. Threshold Values for Key Industry Categories

Evaluation Criteria	Low	Medium	High
Local Growth (private wage & salary jobs only - from IWD)	<0	<= 25%	> 25%
Dispersion	=1	0.5 - 1	<.5
Local Linkages	< 1.25	1.25 - 1.5	> 1.5
Projected Annual Average Growth Rate	< 0	< 1%	> 1%
Projected Annual Average Growth Rate - Output	< 0	< 3%	> 3%
Average Earnings	< 87%	85-100%	> 100%
Export Jobs	< 100	100-500	> 500

Regional Key Industries

The regions key industries are grouped following this section in Tables 16 through 18. Table 16 gives the agricultural and food processing key industries for the region. The highest value added production (or GDP) is generated in meatpacking (slaughtering)

followed by grain and oilseed farming. Meatpacking also had the highest LQ of 44 of the group followed by animal food manufacturing at 19, fish product manufacturing (seafood) at 16, and hog production at 16. Only two of these industries, cattle farming and agricultural services, posted strong job gains in the 2001 to 2006 period in excess of 25 percent, though six posted positive gains. Animal foods manufacturing and meatpacking both posted job reductions, according the BLS statistics over this period.

Dispersion among the firms is mixed. All of the agricultural sectors are of course dispersed, as too are the animal food manufacturers (this would include feed mills). Two industries stand out as not dispersed, meaning the industries are in just one county. Both poultry and fish processing have this characteristic, the remainder are found in at least two counties in the region. The degree of local linkages is very high in seven of the ten industries. This means that there are secondary jobs in the region that are highly dependent on these industries. The only industry with a low linkage indicator is the agricultural services sector because most of the inputs into that sector come from external sources.

Projected U.S. job growth is disappointing in this group. All of the agriculture and ag related sectors will have net negative job growth nationally, with only animal and poultry processing slated for expansion. Agricultural services and all other food processing are expected to grow, but at less than 1 percent per annum. Expectations for national output growth are positive, however, for all 10 industries, with real output gains in oilseed and grain farming expected to top 3 percent per annum in the future.

Average earnings in this category are superior to state averages in all of the agricultural sectors and animal foods. They are average in the remaining food manufacturing with the exception of all other foods where they are lower than the state average.

Last, are export jobs. In four of the sectors there are more than 500 jobs producing for export – jobs dependent on external economic conditions, not local ones. Five have from 100 to 500 export producing jobs, with only the cattle farming sector posting fewer than 100 jobs producing for export.

Table 16. Lakes Region Specialization Industries: Ag and Food Processing

	Industry	Value Added	Location Quotient	Local Growth	Local Dispersion	Local Linkages	Projected U.S. Job Growth	Projected U.S. Output Growth	Average Earnings	Export Jobs
Agriculture & Food Processing	Animal, except poultry, slaughtering	88.9	43.9	■	■	■	■	■	■	■
	Grain farming	84.5	6.6	■	■	■	■	■	■	■
	Oilseed farming	80.7	8.9	■	■	■	■	■	■	■
	Animal production, except cattle and poultry and eggs	32.0	15.8	■	■	■	■	■	■	■
	Poultry processing	29.0	10.8	■	■	■	■	■	■	■
	Other animal food manufacturing	12.6	18.7	■	■	■	■	■	■	■
	All other food manufacturing	10.5	12.0	■	■	■	■	■	■	■
	Agriculture and forestry support activities	9.7	2.4	■	■	■	■	■	■	■
	Seafood product preparation and packaging	8.1	16.4	■	■	■	■	■	■	■
	Cattle ranching and farming	7.5	0.8	■	■	■	■	■	■	■

Table 17 lists other, non-food processing manufacturing key industries. There are 17 of them and they represent a range of production activity. The highest value added is found in the category of pesticide and other organic chemical manufacturing, at $90.2 million, followed by farm machinery and equipment at $73.3 million, and in a distant third other transport equipment at $41.3 million. Other transport equipment had the highest LQ at 108 followed by cylinder manufacturing at 44, and farm machinery and equipment at 40. High levels of local growth were found in ready-mix concrete, fluid cylinders, ethanol (other organic chemical), surgical appliances, and wood kitchen cabinet manufacture. Six of the industries posted employment declines over the 2001 to 2006 period, with six posting growth, but less than 1 percent per year.

Only farm machinery and equipment along with ready mix concrete demonstrated wide dispersion in the region. Concentration in just one county was recorded for eight industries, with the remaining seven found in at least more than one county. Strong local job linkages from suppliers was found in the chemical manufacturing sector, ethanol production, farm machinery and equipment, and other transportation equipment. Very low regional job linkages were noticed in five industries, with eight posting average industrial relationships. Industries with low linkages tend to have lower regional multiplier effects when they grow and when they decline.

As is the case with manufacturing in general in the U.S., the projected job growth of these industries nationally is dire. Twelve are projected to decline, and the remaining five are expected to grow no more than 1 percent per year. Strong real output growth in the U.S. is expected in farm machinery and equipment, transport equipment, and in surgical appliances and supplies. The U.S. data post an expected real decline in output in agricultural chemical manufacturing and commercial printing. Output growth in all other industries is expected to be less than 3 percent per year. Readers will notice that the ethanol sector (other organic chemicals) is slated to lose jobs nationally and may have trouble reconciling that with the current ethanol boom in Iowa. The U.S. corn based ethanol industry will only offset through 2016 about a 10^{th} of those projected losses, given the recently passed energy bill.

Compared to other Iowa firms, earnings were much greater than the state average for printing, prefab wood buildings, chemical manufacture, and aluminum foundry work. Earnings were much below the state average for five industries and about average for seven. Farm machinery and equipment and upholstered furniture had export job estimates that exceeded 500. Six had export jobs amounts ranging from 100 to 500, and nine had export job values that were less than 100.

Table 17. Lakes Region Specialization Industries: Other Manufacturing

	Industry	Value Added	Location Quotient	Local Growth	Local Dispersion	Local Linkages	Projected U.S. Job Growth	Projected U.S. Output Growth	Average Earnings	Export Jobs
Other Manufacturing	Pesticide and other agricultural chemical manufacturing	90.2	15.2	■	■	■	■	■	■	■
	Farm machinery and equipment manufacturing	73.3	39.6	■	■	■	■	■	■	■
	All other transportation equipment manufacturing	41.3	107.7	■	■	■	■	■	■	■
	Upholstered household furniture manufacturing	35.3	27.9	■	■	■	■	■	■	■
	Commercial printing	30.2	3.3	■	■	■	■	■	■	■
	Prefabricated wood building manufacturing	17.8	33.2	■	■	■	■	■	■	■
	Fluid power cylinder and actuator manufacturing	15.2	43.6	■	■	■	■	■	■	■
	Overhead cranes, hoists, and monorail systems	10.5	34.0	■	■	■	■	■	■	■
	Aluminum foundries	8.8	11.8	■	■	■	■	■	■	■
	Surgical appliance and supplies manufacturing	7.5	3.1	■	■	■	■	■	■	■
	Plate work manufacturing	7.3	5.3	■	■	■	■	■	■	■
	Metal valve manufacturing	4.5	2.1	■	■	■	■	■	■	■
	Wood kitchen cabinet and countertop manufacturing	4.1	1.5	■	■	■	■	■	■	■
	Other basic organic chemical manufacturing	4.1	2.3	■	■	■	■	■	■	■
	Ready-mix concrete manufacturing	3.9	1.6	■	■	■	■	■	■	■
	Fabricated structural metal manufacturing	3.3	1.9	■	■	■	■	■	■	■
	Wood container and pallet manufacturing	2.1	3.0	■	■	■	■	■	■	■

Table 18 contains the key industry list for the eleven other industries for the region. From our data sources we discerned that power generation and supply (electric utility) had the most value added in the region at $57.5 million, followed by truck transportation, and non-store retailers. Many of these industries did not make either the minimum employment cut-off or the LQ cut-off but demonstrated growth sufficient enough to gain our attention. Consequently, the highest LQ in the bunch is for other accommodations at 3, the next highest 1.6 in truck transportation, followed by 1.5 for power generation, nonstore retailers, and for artists and performers. Of these industrial groups, six demonstrate strong job growth since 2000, and two, power generation and nonstore retailers indicate declines.

Nine of the 11 industries are dispersed widely throughout the region with only the other accommodations category (these are primarily tourism, camp ground, RV parks, and other direct activities for visitors) and the independent artists and performers indicating a concentration in one county. Among these firms, only the category of motion picture and video production demonstrated a relatively high indirect jobs multiplier. Three had average multipliers, and seven had multipliers in the lower range.

Only power generation is projected nationally to post declines in employment, and eight of the group are in industries that are expected to grow strongly nationally. Similarly, five of the industries are slated for strong U.S. real output growth in excess of 3 percent per annum, and the remaining six are expected to grow also, but by less than 1 percent per year.

Average earnings among the group are lower than the state averages in nine of the 11 categories. Above state-level earnings were posted for sightseeing transport and for other accommodations. Eight of the 11 industries have fewer than 100 export producing jobs, and three have from 100 to 500 export producing jobs.

Table 18. Lakes Region Specialization Industries: All Other Industries

	Industry	Value Added	Location Quotient	Local Growth	Local Dispersion	Local Linkages	Projected U.S. Job Growth	Projected U.S. Output Growth	Average Earnings	Export Jobs
All Other	Power generation and supply	57.5	1.5	■	■	■	■	■	■	■
	Truck transportation	40.1	1.6	■	■	■	■	■	■	■
	Nonstore retailers	18.6	1.5	■	■	■	■	■	■	■
	Hotels and motels, including casino hotels	18.0	1.3	■	■	■	■	■	■	■
	Services to buildings and dwellings	11.3	0.9	■	■	■	■	■	■	■
	Other amusement, gambling, and recreation industries	10.1	1.1	■	■	■	■	■	■	■
	Scenic and sightseeing transportation and support activities for transportation	8.9	0.7	■	■	■	■	■	■	■
	Other accommodations	2.3	3.0	■	■	■	■	■	■	■
	Motion picture and video industries	1.6	0.9	■	■	■	■	■	■	■
	Independent artists, writers, and performers	1.2	1.5	■	■	■	■	■	■	■
	Other educational services	1.0	0.3	■	■	■	■	■	■	■

VI. Import Substitution Opportunities

When we analyze industrial growth opportunities for a region, it is important to assess all components of the regional economy. Thus far, we've looked primarily at regional industrial specialization – areas where the economy is producing goods for exports and are, therefore, key or basic industrial sectors. There are two other important components to normal market activity in a region: overall regional consumption of goods and services (by households, institutions, and private industry), and the amount of imports that flow into a region.

It is instructive to think of an economy as a set of plusses and minuses. One of the ways that we can configure our thinking about regional dynamics is to describe how money accrues to the regional economy. In a very simplified vein,

Regional Income	=	**All regional consumption (households, industries, and institutions)**
	+	**All export sales**
	-	**All import purchase**
	±	**Other factors (investments and savings, taxation, government transfers in, etc)**

Regional economic development planners primarily work at stimulating (or replacing lost) export sales. They generally can do very little about overall regional household consumption patterns, but there are opportunities for an economy to increase regional industrial consumption.

The mechanism for that possible enhancement is through the investigation of potential import substitution by new local industrial production. Imports, according to the simple table above, take income out of an area. By decreasing imports in (a minus) and enhancing production of that commodity locally, you increase regional consumption (a plus).

There are a variety of reasons that commodities are imported. For one, while Iowa farmers like to believe that they feed the world, the vast majority of our household foodstuffs are imported – other parts of the U.S. are much more efficient and

specialized in producing many of the necessary fruits, vegetables, and other food products upon which we rely. A second reason is that there simply is not enough demand density, either by industry or by households, to warrant the location of a production facility in the region. As a third consideration, the region may not possess requisite natural resources or other raw materials necessary to produce the commodity. A good example of this would be petroleum or lumber products. Lastly, there may be labor, infrastructure, or other preemptive market factors that rule out an area from producing a commodity.

Still, it may be possible to expand industrial targeting in an area by investigating industries that might have the potential to locate in a region. If import substitutes can be identified, they have the potential to decrease sales leakages, add jobs, and enhance regional income and job multipliers.

Criteria for Selecting Potential Substitutes

We are estimating the region's imports of manufactured goods using the data produced by our input-output model of the region for 2006. That aggregated data set identifies all the commodities expected to be used by all industries in the Lakes region. It also estimates how much of that commodity demand is expected to be met by local producers. The difference between total commodity demand and the regional commodity supply is the commodity import value. We use following criteria to screen and evaluate our data:

- Total regional imports: We list regional industrial inputs for which estimated imports exceeded $10 million in the most recent year for which data are available.

- Import substitution firm potential: We determine the number of firms of average national size that might be supported by the region's total demand for the given input. This value is obtained by dividing the total national sales for the industry producing the input by the number of firms in that industry nationally. If the average U.S. firm has sales of $20 million, then it would take $20 million of local commodity imports to even consider attracting a new firm.

- Regional specialization: There are two opportunities that present themselves. First, if the industry does not exist in the region, then there is the potential of new industrial recruitment. If the industry does exist, then that industry could expand --

existing firms could try to ramp up production. This measure tells us the presence of the industry, and if present, whether the region already has a competitive advantage.

- Iowa targeted industry: Iowa has several broad categories of industrial targets designed to both build upon state existing strengths and to help diversify its economic structure. This column simply identifies which of the import substitution categories align with the state's current industrial targets.

- Projected U.S. job growth: Expectations for national industrial growth are included to help leaders figure out which industries are destined to expand in the U.S.

- Projected U.S. output growth: Expectations for real growth in industrial output is also an important glimpse into the future. Industries that are destined to expand real sales nationally would be more desirable than those that were not.

Table 19 lists the screening criteria for the indicators that are displayed in Table 20. In most cases the least desirable position is coded as red, the average characteristic in grey, and the superior position is coded blue. In the Iowa targeted industry column, those industries that are not targets are coded grey as this is a dichotomous choice.

Table 20. Screening Criteria for Import Substitution Analysis

	Low	Medium	High
Import Substitute Firm Potential	< 1 firm	1-5 firms	> 5 firms
Regional Specialization	not present	LQ <= 1.5	LQ > 1.5
Iowa Targeted Industry	-	No	Yes
Projected U.S. Job Growth	< 0	<= 1 %	> 1 %
Projected U.S. Output Growth	< 0	<= 3 %	> 3 %

Import Substitution Candidates

Table 21 lists the 42 estimated commodity imports into the region that were in excess of $10 million in 2006. Before analyzing the table a few cautions are in order. It would be a stretch to assume that these commodities and services might automatically be candidates for industrial recruitment. Several of these industries may be disqualified. For example,

- Some industries may be undesirable or unlikely candidates in light of existing national and international production locations and shifts in production locations in recent years.
- Resource-dependent industries such as petroleum refineries require capital-intensive production facilities located near input sources that are not present within the Lakes region.
- Some of the region's import flows represent highly specialized financial and real estate services that are offered only in large, urban financial centers and could not reasonably be produced within the region.
- Other regional import flows through the wholesale trade sector represent highly specialized goods that are demanded in insufficient quantities to merit a local wholesaler. Our modeling system cannot differentiate the types of wholesale goods.

Industries that clearly are not candidates for new industries due to an absence of natural resources or other regional attributes are displayed in italics.

Referring to Table 21, we see that there are four categories that are near or exceed $100 million in estimated regional inputs into production. The greatest of these is management of companies and enterprises at $104 million, followed by refined petroleum at $102 million, other animal food manufacturing at $100 million, and real estate services at 99 million. In the management of companies category, firms that are subsidiaries of other firms are assumed to be, in the main, managed by the parent firm. Real estate services are also a particularly tricky category. It does not mean that there is an overall deficit of real estate services in the region, only that much of real estate services must be purchased by owners of real estate that do not live in the region. For example, agricultural landowners that rent their land may live in another area of Iowa or

another state. The same goes for owners of commercial and rental housing property. All of those private owners of real estate that is rented or leased in the region are part of the real estate industry.

Of the 42 listed commodities, 17 were manufactured goods and eight were in service areas that are valuable to all production in the region, to include management and consulting, architecture and engineering, research and development, legal services, advertising, data processing, employment services, and bookkeeping and accounting.

There were sufficient volumes of imports in 14 industrial categories to warrant at least 5 firms or more potential growth. There was not enough import volume, however, to support even one new firm in 12 of the categories. The remainder could support from 1 to 4 firms.

Ten of the import substitution categories were for industries that did not exist in the region. Six, on the other hand, were in industries in which the region already demonstrated a strong competitive advantage by posting a location quotient in excess of 1.5. The remaining firms had LQ values below 1.5.

Sixteen of the commodity groups were of goods produced by the state of Iowa's targeted industries. The remaining 26 categories were outside of the state's current industrial goals.

U. S job growth in excess of 1 percent per year is expected in 16 of the import substitution categories, and job declines, nationally, are expected in 17. The remaining 9 industries have job growth projections that are less than 1 percent.

Finally, real gains in industrial output in excess of 3 percent per year are projected in 18 of the commodity groups, and declines in four. All others are expected to grow by less than 3 percent per year.

Ten of the categories had three superior level ratings (a blue indicator), however only one of which, animal foods manufacturing, was in a category that the region already demonstrated a competitive advantage. Seven of the categories had at least three inferior ratings (a red indicator or a grey in the targeted industry code), with phosphatic fertilizer, steel mills, paperboard, and sawmilling posting four inferior indications.

Table 21. Import Substitution Candidates for the Lakes Region

Industry	Regional Imports ($mil)	Import Substitution Firm Potential	Regional Specialization	Iowa Targeted Industry	Projected U.S. Job Growth	Projected U.S. Output Growth
Management of companies and enterprises	**103.9**	■	■	■	■	■
Petroleum refineries	*102.1*	■	■	■	■	■
Other animal food manufacturing	**99.5**	■	■	■	■	■
Real estate	**99.4**	■	■	■	■	■
Wholesale trade	**79.8**	■	■	■	■	■
Iron and steel mills	*72.1*	■	■	■	■	■
Other engine equipment manufacturing	**71.4**	■	■	■	■	■
Soybean processing	**54.2**	■	■	■	■	■
Motor vehicle parts manufacturing	**43.9**	■	■	■	■	■
All other miscellaneous professional and technical services	**35.4**	■	■	■	■	■
Oil and gas extraction	*30.0*	■	■	■	■	■
Insurance carriers	**29.9**	■	■	■	■	■
Nondepository credit intermediation and related activities	**28.8**	■	■	■	■	■
Pesticide and other agricultural chemical manufacturing	**23.8**	■	■	■	■	■
Telecommunications	**22.7**	■	■	■	■	■
Other basic organic chemical manufacturing	**22.6**	■	■	■	■	■
Securities, commodity contracts, investments	**22.5**	■	■	■	■	■
Truck transportation	**22.3**	■	■	■	■	■
Management consulting services	**19.9**	■	■	■	■	■
Architectural and engineering services	**19.2**	■	■	■	■	■
Plastics packaging materials, film and sheet	**18.9**	■	■	■	■	■
Monetary authorities and depository credit intermediation	**18.6**	■	■	■	■	■
Paperboard container manufacturing	*17.5*	■	■	■	■	■
Scientific research and development services	**17.3**	■	■	■	■	■
Advertising and related services	**17.2**	■	■	■	■	■
Sawmills	*15.8*	■	■	■	■	■
Pharmaceutical and medicine manufacturing	**15.1**	■	■	■	■	■
Tire manufacturing	**14.5**	■	■	■	■	■
Rail transportation	**14.1**		■	■	■	■
Legal services	**13.5**	■	■	■	■	■
Data processing services	**13.3**	■	■	■	■	■
Semiconductors and related device manufacturing	**13.0**	■	■	■	■	■
Lessors of nonfinancial intangible assets	**12.8**	■	■	■	■	■
Ferrous metal foundaries	**12.7**	■	■	■	■	■
Automotive equipment rental and leasing	**12.1**	■	■	■	■	■
Plastics plumbing fixtures and all other plastics products	**11.8**	■	■	■	■	■
Air transportation	**11.7**	■	■	■	■	■
Metal valve manufacturing	**11.4**	■	■	■	■	■
Phosphatic fertilizer manufacturing	**11.2**	■	■	■	■	■
Warehousing and storage	**10.5**	■	■	■	■	■
Employment services	**10.5**	■	■	■	■	■
Accounting and bookkeeping services	**10.1**	■	■	■	■	■

VII. Regional Export Potential

While the Lakes region must be attentive to a national and a global market, this section focuses on potential trade opportunities with the remainder of the state. In earlier studies we calculated these trade opportunities for regions using metropolitan areas that were within roughly 90 miles of the center of the region. This region is, on average, more than 90 miles away from most of the metropolitan areas, yet it can count on trading with the majority of Iowa's metropolitan areas, to include especially Sioux City, Council Bluffs, the Des Moines and Ames metros, as well as the Waterloo – Cedar Falls metro. To lesser extents the region may be a reliable potential supplier to other areas of the Midwest, to include Omaha, NE, Rochester, MN, the Twin Cities, and Sioux Falls, SD. The same holds for Cedar Rapids, Iowa City, Dubuque, and the Quad Cities. It was decided that the total import needs of the state, after accounting for all inter-regional transactions and for the imports specific to the Lakes region would be an important potential first step in export sales promotion. The logic is very straightforward: it is easier to make a sale relatively close to the region than at a distance.

Table 22 gives the same criteria as in Table 20 for establishing the potential of export production for new firm development. In most cases the least desirable position is coded as red, the average characteristic in grey, and the superior position is coded blue. In the Iowa targeted industry column, those industries that are not targets are coded grey as this is a dichotomous choice.

Table 22. Screening Criteria for Export Firm Analysis

	Low	Medium	High
	■	■	■
Export Production Firm Potential	< 1 firm	1-5 firms	> 5 firms
Regional Specialization	not present	LQ <= 1.5	LQ > 1.5
Iowa Targeted Industry	-	No	Yes
Projected U.S. Job Growth	< 0	<= 1 %	> 1 %
Projected U.S. Output Growth	< 0	<= 3 %	> 3 %

As we noted before, several of these industries may be disqualified outright as not credible candidates. For example,

- Some industries may be undesirable or unlikely candidates in light of existing national and international production locations and shifts in production locations in recent years.

- Resource-dependent industries such as petroleum refineries require capital-intensive production facilities located near input sources that are not present within the Lakes region.

- Some of the region's import flows represent highly specialized financial and real estate services that are offered only in large, urban financial centers and could not reasonably be produced within the region.

- Other regional import flows through the wholesale trade sector represent highly specialized goods that are demanded in insufficient quantities to merit a local wholesaler. Our modeling system cannot differentiate the types of wholesale goods.

Industries that clearly are not candidates for new industries due to an absence of natural resources or other regional attributes are displayed in italics.

Table 23 allows us to identify reasonably proximate candidates for export activity. We have used the same scoring criteria as in the import substitution candidate analysis. This table lists the top 100 candidates, and owing to the high level of detail, only the basics of the table are summarized.

At the outset, the 100 commodity imports range in value for the remainder of the state from $4.033 billion in refined petroleum down to $132.5 million in environmental control manufacturing. There were 16 commodity imports that exceeded $1 billion, 15 with from $500 million to $999 million, and 69 commodities whose estimated import values were under $500 million.

Export firm potential is in excess of five for all but six of the commodity groups. However, production in the commodity was not in evidence for 43 instances, there was at least some to moderate production in 44 of the items, and the region had strong presences in 13 of the commodity groups. The commodity imports were in targeted Iowa industries in 34 instances – the remaining 66 are not part of the state's industrial recruitment goal.

As many of the commodities are manufactured goods, the overall long term job prospects are not good. Of the 100 commodity categories, 55 were expecting job declines at the national level, 24 are expected to grow by less than 1 percent per year, and 26 are expected to exceed 1 percent per annum growth. Real industrial output nationally is expected to decline in 13 of these commodities, grow, but by fewer than 3 percent per year in 47 of the items, and grow by more than 3 percent per year in 30.

Table 24 makes a second pass through the data and only selects commodity imports for which the region had a level of specialization sufficient to assume some productive capacity. In this case we have chosen only the categories for which the region had at least an LQ of .5, again, where an LQ of 1.0 means a region is self-sufficient in production. This table uses $50 million in statewide imports as the cut-off, and coincidentally there are 50 commodity groups.

Notably, seven of the top 10 groups are in nonmanufactured commodities. The values range from $53.2 million in electric power and transformer manufacturing up to $3.215 billion in real estate services. Five exceed $1 billion in imports, and 14 are less than $100 million.

The region has high levels of specialization in 23 of the categories. That means the region has industries with LQ values in excess of 1.5. The remainder, by selection, range from .5 to 1.5. Only 11 of the commodities in this grouping are part of Iowa's targeted industry definitions.

Employment at the national level is expected to decline in 21 of the commodity imports, but employment is expected to grow by more than 1 percent per year in 18 of the items. Overall real output is expected to decline in just three, and it is expected to grow by more than 3 percent per year in 15 items.

Table 23. Export Firm Development Candidates for the Lakes Region

Industry	Net Statewide Imports ($mil)	Export Firm Potential	Regional Specialization	Iowa Targeted Industry	Projected U.S. Job Growth	Projected U.S. Output Growth
Petroleum refineries	**4033.4**	■	■	■	■	■
Real estate	**3821.5**	■	■	■	■	■
Iron and steel mills	**2629.9**	■	■	■	■	■
Wholesale trade	**2325.7**	■	■	■	■	■
Management of companies and enterprises	**2041.6**	■	■	■	■	■
Insurance agencies- brokerages- and related	**1762.9**	■	■	■	■	■
Motor vehicle parts manufacturing	**1719.1**	■	■	■	■	■
Soybean processing	**1455.6**	■	■	■	■	■
Semiconductors and related device manufacturing	**1421.3**	■	■	■	■	■
Telecommunications	**1311.4**	■	■	■	■	■
Other animal food manufacturing	**1176.6**	■	■	■	■	■
All other miscellaneous professional and technical	**1160.9**	■	■	■	■	■
Primary aluminum production	**1145.1**	■	■	■	■	■
Plastics material and resin manufacturing	**1096.0**	■	■	■	■	■
Advertising and related services	**1090.3**	■	■	■	■	■
Securities- commodity contracts- investments	**1017.8**	■	■	■	■	■
Oil and gas extraction	*937.9*	■	■	■	■	■
Paper and paperboard mills	**905.0**	■	■	■	■	■
Truck transportation	**880.3**	■	■	■	■	■
Insurance carriers	**840.7**	■	■	■	■	■
Architectural and engineering services	**820.1**	■	■	■	■	■
Paperboard container manufacturing	**815.7**	■	■	■	■	■
Monetary authorities and depository credit interme	**760.0**	■	■	■	■	■
Petrochemical manufacturing	**723.6**	■	■	■	■	■
Legal services	**612.9**	■	■	■	■	■
Management consulting services	**586.4**	■	■	■	■	■
Aluminum sheet- plate- and foil manufacturing	**584.1**	■	■	■	■	■
Scientific research and development services	**542.4**	■	■	■	■	■
Nondepository credit intermediation and related a	**541.6**	■	■	■	■	■
Ferrous metal foundries	**539.0**	■	■	■	■	■
Metal valve manufacturing	**501.1**	■	■	■	■	■
Other basic organic chemical manufacturing	**480.6**	■	■	■	■	■
Data processing services	**476.7**	■	■	■	■	■
Fabricated structural metal manufacturing	**468.8**	■	■	■	■	■
Accounting and bookkeeping services	**462.2**	■	■	■	■	■
Air transportation	**457.6**	■	■	■	■	■
Motor and generator manufacturing	**456.8**	■	■	■	■	■
Natural gas distribution	**451.6**	■	■	■	■	■
Pesticide and other agricultural chemical manufact	**445.0**	■	■	■	■	■
AC- refrigeration- and forced air heating	**419.5**	■	■	■	■	■
Employment services	**418.5**	■	■	■	■	■
All other electronic component manufacturing	**410.5**	■	■	■	■	■
Pharmaceutical and medicine manufacturing	**403.0**	■	■	■	■	■
Heavy duty truck manufacturing	**379.6**	■	■	■	■	■
Sawmills	*359.7*	■	■	■	■	■
Paint and coating manufacturing	**350.4**	■	■	■	■	■
Copper rolling- drawing- and extruding	**347.9**	■	■	■	■	■
Lessors of nonfinancial intangible assets	**344.0**	■	■	■	■	■
Tire manufacturing	**335.6**	■	■	■	■	■
Information services	**327.8**	■	■	■	■	■

Table 23 (cont'd). Export Firm Development Candidates for the Lakes Region

Industry	Net Statewide Imports ($mil)	Export Firm Potential	Regional Specialization	Iowa Targeted Industry	Projected U.S. Job Growth	Projected U.S. Output Growth
Sheet metal work manufacturing	**320.3**	■	■	■	■	■
Services to buildings and dwellings	**313.2**	■	■	■	■	■
Ready-mix concrete manufacturing	**309.3**	■	■	■	■	■
Machine shops	**303.2**	■	■	■	■	■
Business support services	**297.5**	■	■	■	■	■
Coal mining	*297.3*	■	■	■	■	■
Other engine equipment manufacturing	**289.0**	■	■	■	■	■
All other forging and stamping	**285.7**	■	■	■	■	■
Relay and industrial control manufacturing	**279.1**	■	■	■	■	■
Office administrative services	**270.0**	■	■	■	■	■
Hotels and motels- including casino hotels	**269.4**	■	■	■	■	■
Power generation and supply	**268.8**	■	■	■	■	■
Scenic and sightseeing transportation and support	**265.7**	■	■	■	■	■
Other oilseed processing	**250.8**	■	■	■	■	■
Aluminum foundries	**241.4**	■	■	■	■	■
Fluid power pump and motor manufacturing	**235.5**	■	■	■	■	■
Speed changers and mechanical power transmission e	**232.1**	■	■	■	■	■
Nitrogenous fertilizer manufacturing	**229.8**	■	■	■	■	■
Other rubber product manufacturing	**227.8**	■	■	■	■	■
Other basic inorganic chemical manufacturing	**218.1**	■	■	■	■	■
Rubber and plastics hose and belting manufacturing	**215.9**	■	■	■	■	■
Plastics plumbing fixtures and all other plastics	**202.1**	■	■	■	■	■
Commercial machinery repair and maintenance	**195.9**	■	■	■	■	■
Turned product and screw- nut- and bolt manufacture	**195.3**	■	■	■	■	■
Commercial printing	**193.6**	■	■	■	■	■
Phosphatic fertilizer manufacturing	**190.5**	■	■	■	■	■
Machinery and equipment rental and leasing	**190.3**	■	■	■	■	■
Computer systems design services	**187.2**	■	■	■	■	■
Steel wire drawing	**186.8**	■	■	■	■	■
Wiring device manufacturing	**185.0**	■	■	■	■	■
Ball and roller bearing manufacturing	**183.1**	■	■	■	■	■
Waste management and remediation services	**181.7**	■	■	■	■	■
Reconstituted wood product manufacturing	**175.6**	■	■	■	■	■
Motion picture and video industries	**172.3**	■	■	■	■	■
Cement manufacturing	**168.7**	■	■	■	■	■
Other support services	**168.2**	■	■	■	■	■
Hardware manufacturing	**168.1**	■	■	■	■	■
Metal can- box- and other container manufacturing	**167.7**	■	■	■	■	■
Warehousing and storage	**162.8**	■	■	■	■	■
Coated and laminated paper and packaging materials	**159.0**	■	■	■	■	■
Construction machinery manufacturing	**158.0**	■	■	■	■	■
Couriers and messengers	**155.7**	■	■	■	■	■
Primary nonferrous metal- except copper and alumin	**147.2**	■	■	■	■	■
Coated and uncoated paper bag manufacturing	**145.7**	■	■	■	■	■
Plate work manufacturing	**144.6**	■	■	■	■	■
Synthetic rubber manufacturing	**142.6**	■	■	■	■	■
Soft drink and ice manufacturing	**137.9**	■	■	■	■	■
Miscellaneous fabricated metal product manufacturi	**135.0**	■	■	■	■	■
Veneer and plywood manufacturing	**133.3**	■	■	■	■	■
Automatic environmental control manufacturing	**132.5**	■	■	■	■	■

Table 24. Export Firm Development Candidates for the Lakes Region – Moderate to High Regional Specialization

Industry	Net Statewide Imports ($mil)	Export Firm Potential	Regional Specialization	Iowa Targeted Industry	Projected U.S. Job Growth	Projected U.S. Output Growth
Real estate	**3821.5**	■	■	■	■	■
Wholesale trade	**2325.7**	■	■	■	■	■
Insurance agencies- brokerages- and related	**1762.9**	■	■	■	■	■
Soybean processing	**1455.6**	■	■	■	■	■
Other animal food manufacturing	**1176.6**	■	■	■	■	■
Truck transportation	**880.3**	■	■	■	■	■
Architectural and engineering services	**820.1**	■	■	■	■	■
Monetary authorities and depository credit interme	**760.0**	■	■	■	■	■
Legal services	**612.9**	■	■	■	■	■
Metal valve manufacturing	**501.1**	■	■	■	■	■
Other basic organic chemical manufacturing	**480.6**	■	■	■	■	■
Fabricated structural metal manufacturing	**468.8**	■	■	■	■	■
Accounting and bookkeeping services	**462.2**	■	■	■	■	■
Natural gas distribution	**451.6**	■	■	■	■	■
Pesticide and other agricultural chemical manufact	**445.0**	■	■	■	■	■
Tire manufacturing	**335.6**	■	■	■	■	■
Services to buildings and dwellings	*313.2*	■	■	■	■	■
Ready-mix concrete manufacturing	**309.3**	■	■	■	■	■
Machine shops	**303.2**	■	■	■	■	■
Business support services	**297.5**	■	■	■	■	■
Office administrative services	**270.0**	■	■	■	■	■
Hotels and motels- including casino hotels	**269.4**	■	■	■	■	■
Power generation and supply	**268.8**	■	■	■	■	■
Scenic and sightseeing transportation and support	**265.7**	■	■	■	■	■
Aluminum foundries	**241.4**	■	■	■	■	■
Commercial machinery repair and maintenance	**195.9**	■	■	■	■	■
Turned product and screw- nut- and bolt manufactur	**195.3**	■	■	■	■	■
Commercial printing	**193.6**	■	■	■	■	■
Waste management and remediation services	**181.7**	■	■	■	■	■
Motion picture and video industries	**172.3**	■	■	■	■	■
Other support services	**168.2**	■	■	■	■	■
Plate work manufacturing	**144.6**	■	■	■	■	■
Fluid power cylinder and actuator manufacturing	**127.3**	■	■	■	■	■
Postal service	**123.7**		■	■	■	■
Miscellaneous wood product manufacturing	**119.9**	■	■	■	■	■
Animal- except poultry- slaughtering	**113.4**	■	■	■	■	■
Environmental and other technical consulting servi	**99.8**	■	■	■	■	■
Civic- social- professional and similar organizati	**99.6**	■	■	■	■	■
Transit and ground passenger transportation	**94.1**	■	■	■	■	■
Household goods repair and maintenance	**92.9**	■	■	■	■	■
Sand- gravel- clay- and refractory mining	**86.1**	■	■	■	■	■
Food services and drinking places	**82.4**	■	■	■	■	■
Farm machinery and equipment manufacturing	**80.5**	■	■	■	■	■
Prefabricated metal buildings and components	**72.9**	■	■	■	■	■
Gasket- packing- and sealing device manufacturing	*72.6*	■	■	■	■	■
Surgical appliance and supplies manufacturing	**71.0**	■	■	■	■	■
Independent artists- writers- and performers	**61.3**	■	■	■	■	■
Seafood product preparation and packaging	**57.4**	■	■	■	■	■
Industrial mold manufacturing	**55.0**	■	■	■	■	■
Electric power and specialty transformer manufactu	**53.2**	■	■	■	■	■

VIII. Regional Alignment with State of Iowa Targeted Industries

Methodology for the Targeted Industry Evaluation for the Lakes Region

The following assessment and evaluation has several parts and will take some explaining. The goal of this section was to take a look at the state of Iowa's targeted industry groups and investigate the extent to which the regional industrial structure both aligned with the targeted industry category or could potentially supply inputs to those industrial targets. The point of this exercise was to evaluate the potential linkage that the region has to the state of Iowa's industrial targets as documented in the Battelle Iowa Studies and Reports (http://www.iowalifechanging.com/studies.html). Overall, the state's industrial targets are classified as bioscience industries, advanced manufacturing, or information technology.

This was an intricate estimating process that first identified the NAICS codes of the industrial targets and then aligned those industries with our input output model. The resulting classification yielded 157 distinct industrial sectors in our model. Next, for simplicity's sake, these industries were collapsed into 31 groups using the naming conventions that are in the Battelle studies.

We evaluated the top 20 production input commodities into each of the industrial targets using a national input output model in order to have a thorough sense of each industry's characteristics. We are looking at the total national production recipe for our firms, both inputs that are produced domestically and those that are imported. Then we identified whether industries in the region could supply those commodity inputs to Iowa's targeted industry firms were they to emerge. The region's ability to supply inputs to these industrial groups was scored by weighting the presence of firms that produce that commodity in the region by the overall importance of that commodity to the industrial target. In effect, the more important a commodity input, the higher the score. The point of this analysis is to help regional planners identify their respective abilities to potentially benefit locally from targeted industry growth elsewhere in Iowa, let alone in the region.

Iowa Targeted Industry Alignment and Evaluation

In all, Table 26 below contains quite a bit of data. First, it identifies the overall industrial composition of the major 31 groups as to whether they are advanced manufacturing (AM), bioscience (BIO), or information technology (IT). In nine cases, there are firms in

the groupings that are in more than one category. As an example, ethanol production (Chemicals, organic and agricultural) is classified as a bioscience and as an advanced manufacturing industry – portions of the industry group fit into both taxonomies.

The 31 major groups are much more intuitively easy to grasp than the original 249 detailed categories gleaned from the Battelle research, and give a good sense of the scope of industrial targets deemed important to Iowa's overall long term economic health. By way of evaluation, the first group is the degree of regional linkage demonstrated by the region. Degree of local linkage is the weighted capacity of the region to supply production inputs to the industrial targets, and is calculated relative to the median linkage value for all 31 groups.

As before, we have determined the aggregate potential of the industries to generate jobs in the future as gauged at the national level. We also look at real output growth, where output is roughly the same as gross sales.

A new measure has been added that looks at net Iowa job shifts instead of actual job growth. Despite overall national declines in manufacturing, Iowa's share of manufacturing jobs has been increasing in recent years. We measure here whether the state is realizing share gains (or improvements in its national competitive position in the industry of scrutiny). Next we evaluate wage level. These industries are evaluated at the national level relative to all average earnings per job in all industries. Ideally, the state would want to target industries that, nationally or regionally, paid higher than average per job.

The last column measures the region's occupational alignment with the industrial targets. This is much like the evaluation of the production inputs, only in this instance human capital is the input. For the schedule of necessary occupational needs at the national level, an industry by occupation matrix was matched and aggregated to our input output model. Next, the weighted occupational mix for the targeted industry groups was compared to the region's entire estimated occupational structure to determine the degree to which it was in alignment with the targeted industry and its primary supply change. This measure, in effect, determines whether there is a weak, medium, or strong occupational alignment in the region with the production needs of the targeted industry.

Taken together, these indicators help the region identify its potential to contribute meaningfully to the state's targeted industry goals, and, conversely, the set of target industries' overall potential contribution to job growth in the state.

Table 25 contains the evaluation criteria for Table 26. As before, the more desirable position is coded in blue, the average position in grey, and the undesirable position in red.

Table 25. Evaluation Criteria for State Targeted Industry Alignment

	Low	Mod	High
Evaluation Criteria	■	■	■
Local Linkages (relative to median score for all 31 groups)	<80%	80-120%	>120%
Projected U.S. Job Growth, 2006-2016	< 0	<= 1%	> 1%
Projected U.S. Output Growth, 2006-2016	< 0	<= 3%	> 3%
Iowa Competitive Job Shift	< 0	<= 500	> 500
Wage Level Relative to U.S. All-Industry Average	< 100%	100-150%	> 150%
Occupational Fit (relative to median score for all 31 groups)	<80%	80-120%	>120%

Of the 31 state targeted industry groups in Table 26, the region had a low level of supply linkage in seven, and a high level in 12. Declines in jobs are expected in two-thirds of the industries at the national level, and strong gains in excess of 1 percent per year are only expected in four. Strong real output growth at the national level, however, is expected in 11 categories, and only one, printing and packaging, is expected to decline.

Iowa scores competitive job shifts in excess of 500 jobs when compared to the nation in eight of the categories. This means, all other things equal, Iowa's competitive position in these firms is improving. Iowa's competitive position vis a vis the nation deteriorated in 14 categories. This means that Iowa is losing jobs to the rest of the nation or losing jobs at a faster rate than the nation. In the remaining nine categories, the state has a positive shift, but not in excess of 500 jobs. Much higher worker earnings can be expected in six industrial categories, higher than the national average but less than 150 percent of the national average can be expected in 19 groups, and six industries in the targeted grouping generally compensate below the average U.S. wage.

Last, the region's occupational structure is misaligned with the production requirements of aerospace and defense targets, industrial chemical production, and medical drugs and devices. The region has strong occupational alignment with the production inputs

with five categories, to include ag services, construction components, printing and packaging, communications and network services, and software and computer services. In all other instances the region deviated about the median by a plus or minus 20 percentage points.

Table 26. Lakes Region Alignment With State of Iowa Industrial Targets

AM	BIO	IT	Targeted Industry Grouping	Local Linkages	Projected U.S. Job Growth	Projected U.S. Output Growth	Iowa Competitive Job Shift	U.S. Wage Level	Occupational Alignment
●			Aerospace and Defense	■	■	■	■	■	■
●	●		Automation Precision Machinery - Bioscience Focus	■	■	■	■	■	■
●		●	Automation Precision Machinery - IT Focus	■	■	■	■	■	■
●			Automation Precision Machinery - Other	■	■	■	■	■	■
●		●	Electronic & Computer Hardware Components - Semiconductors & Electronic Components	■	■	■	■	■	■
●		●	Electronic & Computer Hardware Components - Computers & Peripherals	■	■	■	■	■	■
●		●	Electronic & Computer Hardware Components - Communications & Media	■	■	■	■	■	■
●		●	Electronic & Computer Hardware Components - Media Recording Equipment	■	■	■	■	■	■
●			Commercial & Industrial Motor Vehicles	■	■	■	■	■	■
●			Power Generation Equipment	■	■	■	■	■	■
●			Industrial Metal Processing	■	■	■	■	■	■
●	●		Digital & Electronic Devices - Bioscience Focus	■	■	■	■	■	■
●			Digital & Electronic Devices - Other	■	■	■	■	■	■
●			Environment Control Systems	■	■	■	■	■	■
		●	Communications & Media Equipment - Cable and Wire	■	■	■	■	■	■
●			Active Chemical Agents	■	■	■	■	■	■
●			Polymers & Coatings	■	■	■	■	■	■
●			Industrial Chemicals	■	■	■	■	■	■
●	●		Chemicals - Organic and Agricultural	■	■	■	■	■	■
●	●		Medical Drugs & Devices	■	■	■	■	■	■
●	●		Agricultural Processing	■	■	■	■	■	■
●			Construction Components	■	■	■	■	■	■
●			Printing and Packaging	■	■	■	■	■	■
	●		Agricultural Services	■	■	■	■	■	■
			Engineering Related Services - Bioscience Focus	■	■	■	■	■	■
●			Engineering Related Services - Other	■	■	■	■	■	■
		●	Communications Network Services	■	■	■	■	■	■
		●	Internet & Data Services	■	■	■	■	■	■
		●	Media Services	■	■	■	■	■	■
		●	Software & Computer Services	■	■	■	■	■	■
	●		Hospitals & Labs	■	■	■	■	■	■

IX. An Occupational Evaluation for the Lakes Region

This next section addresses the region's occupational structure. It is designed to give the region a clear perspective on the kind of industries that it is attractive to by virtue of the skill and knowledge base of its workforce. There are several innovative and somewhat complicated calculations involved in this assessment, but there are other components that are very similar to analyses done in previous sections.

In the first instance it must be emphasized that the occupational structure developed for this assessment is based on the region's industrial composition and the expected staffing that those industries would require. We have not surveyed industries to gauge occupations; instead we have identified employment in specific industries in the region and then we applied national average industrial staffing components to the regional industrial structure.

Like our previous assessments, we have compiled a location quotient indicator for the region by different occupation. The location quotient is merely the percentage of occupations in a sector locally of the total occupations locally as compared to the same occupational percentage at the national level. From that analysis, we have chosen the top 25 occupations, those where the region has strong location quotients, and the bottom 25 occupations, those where the area has weak location quotients.

Next we compiled several qualitative measures for our occupational groupings.

1. Projected growth. The compounded annual growth rates in employment by occupation from 2006-2016 are based on estimates for the United States from the Bureau of Labor Statistics. Occupations with projected employment declines are coded as "low" and are colored red, occupations with growth rates below the all-occupation average of .99 percent are "moderate" and colored grey, and occupations projected to grow more rapidly than the average rates are "high" and coded blue.

2. Average earnings. Average annual wages by occupation for the United States were calculated using 2006 data from the Bureau of Labor Statistics. Occupations earning less than 85 percent of the all-occupation average are coded as "low," occupations between 85 and 100% of average are "moderate," and occupations earning above the average wages are "high."

3. Education. The education index measures the percentage of workers from 25 to 44 years of age with a 4-year college degree or higher educational attainment. This measure may be used to evaluate the educational requirements of various occupations as well as the relative attractiveness of those occupations to young, college-educated workers. The data were obtained from Occupational Projections and Training Data files from the Bureau of Labor Statistics. All occupations were ranked in order of the college-educated worker percentages. In this report, occupations coded in red fall into the lowest quarter of all U.S. occupations. In these occupations, fewer than 8.7 percent of young workers have a college degree. Occupations coded in grey are in the second lowest quartile of U.S. occupations, with values between 8.7 percent and 18.6 percent. Occupations coded in blue are among the top half of U.S. occupations, ranked by percentage of young workers with a college degree.

4. Knowledge index and STEM knowledge index. The knowledge index scores are based upon a national data set that describes the type, level, and importance of knowledge typically required to perform jobs in different occupations. The information used here was obtained from the O*NET Version 12.0 database, maintained by the U.S. Department of Labor, Employment and Training Administration. The O*NET database contains data for more than 900 occupations and 33 knowledge areas including engineering and technology, mathematics, science, business and management, production, logistics, health services, education and training, and others.

   Occupations in the national data set are rated by the level of knowledge (1-7) and its importance (1-5) in performing the job. Ratings are provided by individual knowledge area. For this report, scores across all knowledge areas were aggregated to construct an overall knowledge requirement score for an occupation. The scores for each occupation were obtained by multiplying the "level" scores by the "importance" score in each knowledge area, yielding a maximum overall value of 35 and a minimum of zero, and then averaging those resulting values across all knowledge areas. A subset of the knowledge areas was also used to construct a "STEM" index that describes knowledge requirements in science, technology, engineering, and mathematics.

   The occupations are color-coded according to their national average knowledge requirements. Local differences in knowledge requirements are not captured within this analysis. Occupations falling in the bottom third of all U.S. occupations, as measured by their knowledge index, are coded in red. Occupations in the middle third are coded in gray, and occupations in the top third are coded in blue.

Table 27 summarizes the screening criteria and cutoffs established for the next two tables.

Table 27. Evaluation Criteria for Occupational Analysis

Criteria	Low	Moderate	High
Evaluation Criteria	■	■	■
Average annual U.S. employment growth, 2006-2016	<0	<= 0.99%	> 0.99%
U.S. average annual earnings index	< 85%	85-100%	> 100%
U.S. self-employment index (all-occupation average is 7.5%)	< 7.5%	7.5 - 15%	> 15%
% College degree or higher educational attainment for workers ages 25-44	< 9%	9 - 19%	> 19 %
Knowledge index	< 3.4	3.4 - 5.3	> 5.3
Science, Technology, Engineering, and Mathematics (STEM) Knowledge index	< 4.1	4.1 - 5.9	> 5.9

Table 28 lists the region's occupational strengths. All have location quotients based on national figures that are greater than 1.0. Relative to Iowa, the region shows strengths in five categories, weaknesses in four, and similar characteristics in 16. Of the region's strengths, though, eight are expected to post strong growth, another seven some growth, but 10 are slated to decline in numbers nationally. Earnings are below 85 percent of the U.S. average in 17 of the occupations, and above 115 percent of the U.S. average in just four. Three-fifths of the occupations scored in the lowest group in terms of the college index, while 17 were in the middle or higher group on the knowledge index. The STEM statistics, however, is very low. Just four occupational strengths scored in the higher group, and 16 scored in the bottom group.

Table 29 contains the region's occupational deficits. The location quotient ranges from the near-average .9 to .3 for computer specialists. Disturbingly, when compared to Iowa, the region is below the state average in all but one category. The importance of these occupations nationally is indicated by the growth category – all are slated to grow in number, and 14 are expected to grow smartly. Among these occupations, 16 have very high average earnings, and six have low average earnings. Another 16 score highest on the college index, and 13 score highest on the knowledge index. The STEM score for this group, however, is really not that much better than the previous table: 11 score in the lowest group, and six are in the highest.

Table 28. Lakes Region Occupational Evaluation -- Regional Occupational Specialization

Occupation Group	Location Quotient U.S.	Location Quotient IA	Projected U.S. Growth	U.S. Average Earnings	College Index	Knowledge Index	STEM Index
Food Processing Workers	7.7	■	■	■	■	■	■
Supervisors, Farming, Fishing, and Forestry Workers	4.0	■	■	■	■	■	■
Woodworkers	3.0	■	■	■	■	■	■
Farming and Other Specialized Industry Managers	2.6	■	■	■	■	■	■
Agricultural Workers	2.5	■	■	■	■	■	■
Printing Workers	2.0	■	■	■	■	■	■
Supervisors, Production Workers	1.6	■	■	■	■	■	■
Other Production Occupations	1.5	■	■	■	■	■	■
Nursing, Psychiatric, and Home Health Aides	1.4	■	■	■	■	■	■
Material Moving Workers	1.3	■	■	■	■	■	■
Motor Vehicle Operators	1.2	■	■	■	■	■	■
Metal Workers and Plastic Workers	1.2	■	■	■	■	■	■
Assemblers and Fabricators	1.2	■	■	■	■	■	■
Retail Sales Workers	1.2	■	■	■	■	■	■
Supervisors, Transportation and Material Moving Workers	1.1	■	■	■	■	■	■
Supervisors, Sales Workers	1.1	■	■	■	■	■	■
Vehicle and Mobile Equipment Mechanics, Installers, and Repairers	1.1	■	■	■	■	■	■
Cooks and Food Preparation Workers	1.1	■	■	■	■	■	■
Other Food Preparation and Serving Related Workers	1.1	■	■	■	■	■	■
Textile, Apparel, and Furnishings Workers	1.1	■	■	■	■	■	■
Supervisors, Food Preparation and Serving Workers	1.1	■	■	■	■	■	■
Counselors, Social Workers, and Other Community and Social Service Specialists	1.1	■	■	■	■	■	■
Material Recording, Scheduling, Dispatching, and Distributing Workers	1.1	■	■	■	■	■	■
Food and Beverage Serving Workers	1.0	■	■	■	■	■	■
Other Installation, Maintenance, and Repair Occupations	1.0	■	■	■	■	■	■

Table 29. Lakes Region Occupational Evaluation -- Regional Occupational Deficits

Occupation Group	Location Quotient U.S.	Location Quotient IA	Projected U.S. Growth	U.S. Average Earnings	College Index	Knowledge Index	STEM Index
Computer Specialists	0.3	■	■	■	■	■	■
Sales Representatives, Services	0.5	■	■	■	■	■	■
Engineers	0.6	■	■	■	■	■	■
Business Operations Specialists	0.6	■	■	■	■	■	■
Operations Specialties Managers	0.6	■	■	■	■	■	■
Other Healthcare Support Occupations	0.6	■	■	■	■	■	■
Lawyers, Judges, and Related Workers	0.6	■	■	■	■	■	■
Drafters, Engineering, and Mapping Technicians	0.6	■	■	■	■	■	■
Health Diagnosing and Treating Practitioners	0.6	■	■	■	■	■	■
Financial Specialists	0.6	■	■	■	■	■	■
Electrical and Electronic Equipment Mechanics, Installers, and Repairers	0.7	■	■	■	■	■	■
Entertainers and Performers, Sports and Related Workers	0.7	■	■	■	■	■	■
Health Technologists and Technicians	0.7	■	■	■	■	■	■
Secretaries and Administrative Assistants	0.8	■	■	■	■	■	■
Information and Record Clerks	0.8	■	■	■	■	■	■
Other Sales and Related Workers	0.8	■	■	■	■	■	■
Other Office and Administrative Support Workers	0.8	■	■	■	■	■	■
Art and Design Workers	0.8	■	■	■	■	■	■
Helpers, Construction Trades	0.8	■	■	■	■	■	■
Supervisors, Construction and Extraction Workers	0.8	■	■	■	■	■	■
Construction Trades Workers	0.8	■	■	■	■	■	■
Supervisors, Office and Administrative Support Workers	0.8	■	■	■	■	■	■
Entertainment Attendants and Related Workers	0.8	■	■	■	■	■	■
Financial Clerks	0.9	■	■	■	■	■	■
Top Executives	0.9	■	■	■	■	■	■